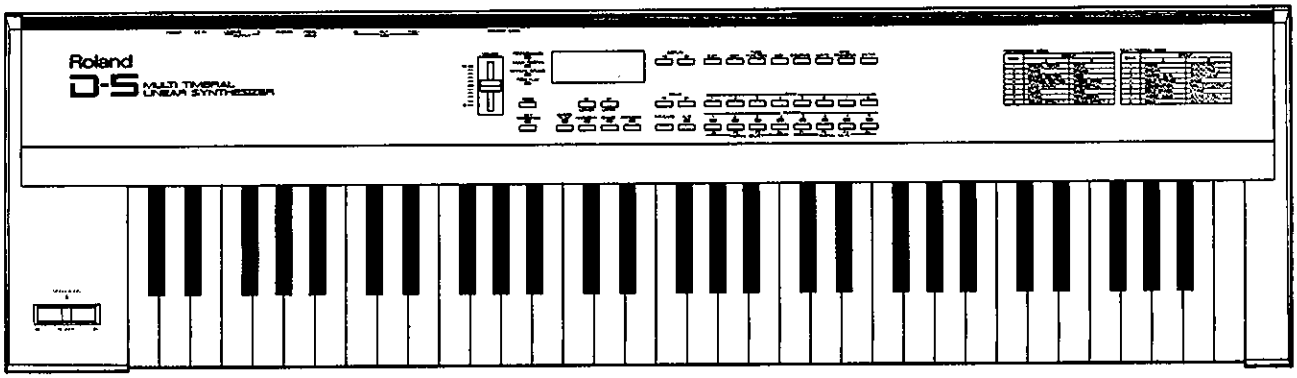
Roland

MIDI MULTI TIMBRAL LINEAR SYNTHESIZER

D-5

Owner's Manual (Play Volume)



For Nordic Countries

Apparatus containing Lithium batteries

ADVARSEL!

Lithiumbatteri. Eksplosionsfare.
Udskiftning må kun foretages af en sagkyndig, og som beskrevet i servicemanual.

VARNING!

Lithiumbatteri. Explosionsrisk.
Får endast bytas av behörig servicetekniker.
Se instruktioner i servicemanualen.

ADVARSEL!

Lithiumbatteri. Fare for eksplotion.
Må bare skiftes av kvalifisert tekniker som beskrevet i servicemanualen.

VAROITUS!

Lithiumparisto. Räjähdysvaara.
Pariston saa vaihtaa ainoastaan alan ammottimies.

For Germany

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

ROLAND MULTI TIMBRAL LINEAR SYNTHESIZER D-5
(Gerät. Typ. Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

Amtsbl. Vfg 1046/1984
(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Roland Corporation Osaka/Japan
Name des Herstellers/Importeurs

For the USA

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorized changes or modification to this system can void the users authority to operate this equipment.
This equipment requires shielded interface cables in order to meet FCC class B Limit.

For Canada

CLASS B **NOTICE**

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

CLASSE B **AVIS**

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Réglement des signaux parasites par le ministère canadien des Communications.

A GROUP D-5 Preset Patchs (Patch Sound Chart)

Roland

Bank	No.	Patch Name	Key Mode	Effect	Used Tone(Partials)		MIDI Prog.C#	Bank	No.	Patch Name	Key Mode	Effect	Used Tone(Partials)		MIDI Prog.C#
					Upper	Lower							Upper	Lower	
1	1	Hyper Ensemble	Dual	Chord	i 17(2)	a 33(4)	001	5	1	Fat Lead	Whole	Off	b 17(4)	*	033
	2	Sweet Memories	Split	Harmo.	b 03(3)	b 07(4)	002		2	Square Lead	Dual	Off	b 20(2)	i 46(2)	034
	3	Flamenco Guitar	Dual	Chase	i 39(3)	i 39(3)	003		3	Brassy Solo	Dual	Chord	b 18(2)	b 18(2)	035
	4	Piano Etude	Split	Arp.	a 01(3)	a 01(3)	004		4	Saw Lead	Dual	Off	i 45(2)	i 45(2)	036
	5	Staccato Play	Dual	Chord	a 22(2)	i 43(4)	005		5	Doctor Solo	Dual	Off	i 48(2)	i 48(2)	037
	6	C&W Harmony	Whole	Harmo.	a 03(3)	*	006		6	Clav+Organ Lead	Dual	Chase	a 11(2)	a 21(2)	038
	7	Bend me 5ths	Dual	Chase	i 30(3)	i 30(3)	007		7	Metalized Dist	Dual	Off	i 43(4)	b 19(2)	039
	8	Electric Beat	Split	Arp.	i 56(2)	r 18(1)	008		8	Neat Lead	Whole	Off	i 47(3)	*	040
2	1	Touch Piano	Whole	Off	i 01(4)	*	009	6	1	12 String Guitar	Dual	Off	b 38(3)	b 38(3)	041
	2	Hammered Piano	Whole	Chase	i 02(4)	*	010		2	Pick Guitar	Whole	Off	i 40(3)	*	042
	3	Synth Piano	Dual	Off	i 03(4)	a 02(2)	011		3	Pedal Steel	Whole	Off	i 38(2)	*	043
	4	Honky-Tonk Piano	Whole	Off	a 04(3)	*	012		4	Backing EG	Dual	Off	i 42(3)	i 42(3)	044
	5	Tapped E-Piano	Whole	Off	i 04(3)	*	013		5	Overdrive Gtr	Dual	Chase	i 43(4)	b 22(2)	045
	6	Bright EP	Whole	Off	i 05(3)	*	014		6	Synth Dulcimer	Whole	Off	i 41(4)	*	046
	7	Sweeten Piano	Dual	Off	a 07(2)	i 49(2)	015		7	Funky Clav	Dual	Off	a 22(2)	a 22(2)	047
	8	Choired Piano	Dual	Off	a 02(2)	i 26(3)	016		8	Wired Harpsi	Dual	Off	a 17(3)	a 18(2)	048
3	1	Brasssynth	Dual	Off	a 37(4)	i 45(2)	017	7	1	Melodic Koto	Dual	Chase	b 41(2)	b 41(2)	049
	2	Soft Brass	Whole	Off	i 18(4)	*	018		2	Breath Shakuhati	Whole	Chase	i 16(4)	*	050
	3	Big ol'Brass	Dual	Off	i 17(2)	i 17(2)	019		3	Japanese Plucks	Dual	Off	b 42(2)	b43(2)	051
	4	Sweep Horns	Dual	Off	i 20(2)	i 24(2)	020		4	Trad Sho	Whole	Chase	b 44(4)	*	052
	5	Brazz	Whole	Off	i 21(4)	*	021		5	Indian Sitar	Whole	Chase	b 47(4)	*	053
	6	Low Brass	Dual	Chase	a 38(3)	a 45(3)	022		6	Incaic Flute	Dual	Off	a 53(3)	a 53(3)	054
	7	Jingle Brass	Dual	Off	i 19(2)	i 52(2)	023		7	Steel Band	Whole	Chase	b 48(4)	*	055
	8	Pianish Horns	Dual	Off	i 05(3)	i 20(2)	024		8	Balinese Hit!	Dual	Chase	b 52(4)	b 55(3)	056
4	1	Warm Str Fade	Whole	Off	i 09(4)	*	025	8	1	Howling Wolves	Whole	Chase	i 60(1)	*	057
	2	Deep Strings Ens	Whole	Off	i 10(4)	*	026		2	Grasshoppers	Dual	Chase	b 62(2)	b 62(2)	058
	3	Fat Strings	Dual	Off	i 13(3)	i 13(3)	027		3	Telephone Ring	Whole	Chase	b 60(1)	*	059
	4	Arco Strings	Dual	Chase	a 35(2)	a 25(3)	028		4	Bird Twitter	Dual	Chase	b 58(1)	b 58(1)	060
	5	Vibe Strings	Whole	Off	b 16(4)	*	029		5	Dive into Water	Whole	Chase	i 59(2)	*	061
	6	Sforzand Strings	Whole	Off	i 12(4)	*	030		6	Cosmic Waves	Dual	Off	i 62(2)	i 62(2)	062
	7	Cosmostrings	Dual	Off	a 64(2)	a 34(3)	031		7	Random EFX	Dual	Arp.	i 63(2)	i 63(2)	063
	8	Hollow Koto	Dual	Chase	b 41(2)	i 11(4)	032		8	Reverse Spin	Dual	Chase	b 51(2)	b 51(2)	064

Effect: Chord (Chord Play), Harmo. (Harmony), Chase (Chase), Arp. (Arpeggio)

*: Same as Upper Tone

B GROUP D-5 Preset Patchs (Patch Sound Chart)

Roland

Bank	No.	Patch Name	Key Mode	Effect	Used Tone(Partials)		MIDI Prog.C#
					Upper	Lower	
1	1	Voxy Women Sing	Whole	Off	i 28(4)	*	065
	2	Tenor Voices	Whole	Off	i 25(4)	*	066
	3	Delicate Voices	Dual	Off	i 26(3)	i 26(3)	067
	4	Peaceful Choir	Dual	Off	b 03(3)	a 34(3)	068
	5	Glass Voices	Whole	Off	i 29(4)	*	069
	6	Harmonic Vox	Dual	Off	i 22(2)	i 27(2)	070
	7	Velo-Oct Synth	Dual	Off	b 14(2)	b 14(2)	071
	8	Skipping Track	Whole	Chase	b 05(4)	*	072
2	1	Elec Organ	Whole	Off	a 09(4)	*	073
	2	Rotor Organ	Whole	Off	i 06(4)	*	074
	3	Jazzy Organ	Whole	Chase	i 08(3)	*	075
	4	Church Organ	Dual	Chase	a 13(3)	a 15(2)	076
	5	Pforgan	Dual	Off	a 12(1)	a 07(2)	077
	6	Moss Organ	Whole	Off	i 07(4)	*	078
	7	Str-organ	Dual	Chase	a 10(2)	a 35(2)	079
	8	Distorgan	Dual	Chase	i 44(4)	a 12(1)	080
3	1	Blow Sax	Dual	Chase	a 57(2)	a 54(3)	081
	2	Sax Duo	Split	Off	a 58(2)	a 59(2)	082
	3	Synth Harmonica	Dual	Off	i 22(2)	i 22(2)	083
	4	Tango Passion	Split	Arp.	a 16(2)	i 39(3)	084
	5	Squeeze Reed	Whole	Off	i 23(3)	*	085
	6	Clavitroid	Whole	Chase	i 32(4)	*	086
	7	Rich Wood	Whole	Chase	i 31(4)	*	087
	8	Harmonicity	Dual	Off	b 02(4)	a 64(2)	088
4	1	Soft Flute	Dual	Off	i 15(3)	i 15(3)	089
	2	Winds Ensemble	Dual	Chase	a 51(3)	a 50(2)	090
	3	Recorders	Dual	Chase	a 52(2)	a 52(2)	091
	4	Master Clarinet	Split	Off	b 61(3)	a 60(2)	092
	5	Bassoon-Oboe	Split	Chase	a 62(3)	a 63(2)	093
	6	Blow Pipes	Whole	Chase	i 14(3)	*	094
	7	Breathy Ens.	Split	Off	a 54(3)	a 55(4)	095
	8	Human Whistle	Dual	Chase	a 56(2)	a 56(2)	096
5	1	Orchestra Hit!	Dual	Chase	b 57(4)	b 57(4)	097
	2	Violin-Strings	Dual	Off	a 33(4)	a 26(2)	098
	3	Bright Brass	Dual	Off	a 40(4)	a 57(2)	099
	4	Concert Flute	Whole	Chase	a 49(4)	*	100
	5	Pizzicato	Whole	Off	a 30(3)	*	101
	6	Crystal Celesta	Dual	Off	a 23(3)	a 24(2)	102
	7	Rain Harp	Whole	Chase	a 31(3)	*	103
	8	Timpani & Cymbal	Split	Arp.	r 05(2)	b 53(2)	104
6	1	Fat Synth Bass	Dual	Off	i 34(2)	i 37(3)	105
	2	Hoppin' Bass	Dual	Off	i 33(3)	b 21(3)	106
	3	Fretless Bass	Dual	Off	i 36(3)	b 32(2)	107
	4	Sync Bass	Whole	Off	i 35(2)	*	108
	5	Ac-Bass & Vibe	Split	Off	b 33(2)	b25(2)	109
	6	Hawaiian Palm	Split	Chase	i 38(2)	b 26(1)	110
	7	Brass Combo	Split	Off	a 37(4)	b 22(2)	111
	8	Synth Combo	Split	Off	i 32(4)	b 24(3)	112
7	1	Joyful Times	Dual	Arp.	b 33(2)	b 07(4)	113
	2	Tinny Chime	Dual	Chase	i 51(3)	i 49(2)	114
	3	Fantasy Bells	Dual	Chase	i 52(2)	b 01(4)	115
	4	Alarm Clock	Dual	Arp.	i 52(2)	b 54(2)	116
	5	Gruis Bell	Whole	Off	i 50(4)	*	117
	6	Wood Percussion	Dual	Chase	i 54(2)	b 36(2)	118
	7	Drop Hit	Dual	Chase	i 53(4)	i 51(3)	119
	8	Power Beat	Split	Chase	r 23(1)	i 55(1)	120
8	1	Seashore ...	Whole	Chase	i 61(4)	*	121
	2	One Note Jam ?	Split	Chase	b 59(4)	b 59(4)	122
	3	Attack! Attack!	Whole	Chase	i 57(3)	*	123
	4	Water Bells	Whole	Chase	b 63(3)	*	124
	5	Scene of Battle	Split	Arp.	i 58(3)	i 58(3)	125
	6	Jungle Tune	Whole	Chase	b 64(4)	*	126
	7	Explosion	Dual	Chase	r 23(1)	r 48(1)	127
	8	Takeoff Jet	Whole	Chase	i 64(4)	*	128

Effect: Chord (Chord Play), Harmo. (Harmony), Chase (Chase), Arp. (Arpeggio)

*: Same as Upper Tone

A GROUP D-5 Preset Timbres (Timbre Sound Chart)

Roland

Bank	No.	Tone Name	Number of Partials	MIDI Prog. C #	Bank	No.	Tone Name	Number of Partials	MIDI Prog. C #
1	1	a01:AcouPiano1	3	001	5	1	a33:Strings 1	4	033
	2	a02:AcouPiano2	2	002		2	a34:Strings 2	3	034
	3	a03:AcouPiano3	2	003		3	a35:Strings 3	2	035
	4	a04:Honky-Tonk	3	004		4	a36:Strings 4	3	036
	5	a05:ElecPiano1	3	005		5	a37:Brass 1	4	037
	6	a06:ElecPiano2	3	006		6	a38:Brass 2	3	038
	7	a07:ElecPiano3	2	007		7	a39:Brass 3	4	039
	8	a08:ElecPiano4	1	008		8	a40:Brass 4	4	040
2	1	a09:ElecOrgan1	4	009	6	1	a41:Trumpet 1	3	041
	2	a10:ElecOrgan2	2	010		2	a42:Trumpet 2	2	042
	3	a11:ElecOrgan3	2	011		3	a43:Trombone 1	3	043
	4	a12:ElecOrgan4	1	012		4	a44:Trombone 2	2	044
	5	a13:PipeOrgan1	3	013		5	a45:Horn	3	045
	6	a14:PipeOrgan2	3	014		6	a46:Fr Horn	2	046
	7	a15:PipeOrgan3	2	015		7	a47:Engl Horn	2	047
	8	a16:Accordion	2	016		8	a48:Tuba	2	048
3	1	a17:Harpsi 1	3	017	7	1	a49:Flute 1	4	049
	2	a18:Harpsi 2	2	018		2	a50:Flute 2	2	050
	3	a19:Harpsi 3	1	019		3	a51:Piccolo	3	051
	4	a20:Clav 1	3	020		4	a52:Recorder	2	052
	5	a21:Clav 2	2	021		5	a53:Pan Pipes	3	053
	6	a22:Clav 3	2	022		6	a54:Bottleblow	3	054
	7	a23:Celesta 1	3	023		7	a55:Breathpipe	4	055
	8	a24:Celesta 2	2	024		8	a56:Whistle	2	056
4	1	a25:Violin 1	3	025	8	1	a57:Sax 1	2	057
	2	a26:Violin 2	2	026		2	a58:Sax 2	2	058
	3	a27:Cello 1	3	027		3	a59:Sax 3	2	059
	4	a28:Cello 2	2	028		4	a60:Clarinet 1	2	060
	5	a29:Contrabass	2	029		5	a61:Clarinet 2	3	061
	6	a30:Pizzicato	3	030		6	a62:Oboe	3	062
	7	a31:Harp 1	3	031		7	a63:Bassoon	2	063
	8	a32:Harp 2	2	032		8	a64:Harmonica	2	064

B GROUP D-5 Preset Timbres (Timbre Sound Chart)

Roland

Bank	No.	Tone Name	Number of Partials	MIDI Prog. C #
1	1	b01:Fantasy	4	065
	2	b02:Harmo Pan	4	066
	3	b03:Chorale	3	067
	4	b04:Glasses	3	068
	5	b05:Soundtrack	4	069
	6	b06:Atmosphere	4	070
	7	b07:Warm Bell	4	071
	8	b08:Space Horn	4	072
2	1	b09:Echo Bell	3	073
	2	b10:Ice Rains	4	074
	3	b11:Oboe 2002	2	075
	4	b12:Echo Pan	2	076
	5	b13:Bell Swing	3	077
	6	b14:Reso Synth	2	078
	7	b15:Steam Pad	3	079
	8	b16:VibeString	4	080
3	1	b17:Syn Lead 1	4	081
	2	b18:Syn Lead 2	2	082
	3	b19:Syn Lead 3	2	083
	4	b20:Syn Lead 4	2	084
	5	b21:Syn Bass 1	3	085
	6	b22:Syn Bass 2	2	086
	7	b23:Syn Bass 3	2	087
	8	b24:Syn Bass 4	3	088
4	1	b25:AcouBass 1	2	089
	2	b26:AcouBass 2	1	090
	3	b27:ElecBass 1	2	091
	4	b28:ElecBass 2	2	092
	5	b29:SlapBass 1	2	093
	6	b30:SlapBass 2	3	094
	7	b31:Fretless 1	4	095
	8	b32:Fretless 2	2	096
5	1	b33:Vibe	2	097
	2	b34:Glock	3	098
	3	b35:Marimba	3	099
	4	b36:Xylophone	2	100
	5	b37:Guitar 1	3	101
	6	b38:Guitar 2	3	102
	7	b39:Elec Gtr 1	4	103
	8	b40:Elec Gtr 2	4	104
6	1	b41:Koto	2	105
	2	b42:Shamisen	2	106
	3	b43:Jamisen	2	107
	4	b44:Sho	4	108
	5	b45:Shakuhachi	4	109
	6	b46:WadaikoSet	4	110
	7	b47:Sitar	4	111
	8	b48:Steel Drum	4	112
7	1	b49:Tech Snare	4	113
	2	b50:Elec Tom	4	114
	3	b51:Revrse Cym	2	115
	4	b52:Ethno Hit	4	116
	5	b53:Timpani	2	117
	6	b54:Triangle	2	118
	7	b55:Wind Bell	3	119
	8	b56:Tube Bell	4	120
8	1	b57:Orche Hit	4	121
	2	b58:Bird Tweet	1	122
	3	b59:OneNoteJam	4	123
	4	b60:Telephone	1	124
	5	b61:Typewriter	2	125
	6	b62:Insect	2	126
	7	b63:WaterBells	3	127
	8	b64:JungleTune	4	128

D-5 Preset Tones

a GROUP

No.	Tones	Number of Partials
01	AcouPiano1	3
02	AcouPiano2	2
03	AcouPiano3	2
04	Honky-Tonk	3
05	ElecPiano1	3
06	ElecPiano2	3
07	ElecPiano3	2
08	ElecPiano4	1
09	ElecOrgan1	4
10	ElecOrgan2	2
11	ElecOrgan3	2
12	ElecOrgan4	1
13	PipeOrgan1	3
14	PipeOrgan2	3
15	PipeOrgan3	2
16	Accordion	2
17	Harpsi 1	3
18	Harpsi 2	2
19	Harpsi 3	1
20	Clav 1	3
21	Clav 2	2
22	Clav 3	2
23	Celesta 1	3
24	Celesta 2	2
25	Violin 1	3
26	Violin 2	2
27	Cello 1	3
28	Cello 2	2
29	Contrabass	2
30	Pizzicato	3
31	Harp 1	3
32	Harp 2	2
33	Strings 1	4
34	Strings 2	3
35	Strings 3	2
36	Strings 4	3
37	Brass 1	4
38	Brass 2	3
39	Brass 3	4
40	Brass 4	4
41	Trumpet 1	3
42	Trumpet 2	2
43	Trombone 1	3
44	Trombone 2	2
45	Horn	3
46	Fr Horn	2
47	Engl Horn	2
48	Tuba	2
49	Flute 1	4
50	Flute 2	2
51	Piccolo	3
52	Recorder	2
53	Pan Pipes	3
54	Bottleblow	3
55	Breathpipe	4
56	Whistle	2
57	Sax 1	2
58	Sax 2	2
59	Sax 3	2
60	Clarinet 1	2
61	Clarinet 2	3
62	Oboe	3
63	Bassoon	2
64	Harmonica	2

b GROUP

No.	Tones	Number of Partials
01	Fantasy	4
02	Harmo Pan	4
03	Chorale	3
04	Glasses	3
05	Soundtrack	4
06	Atmosphere	4
07	Warm Bell	4
08	Space Horn	4
09	Echo Bell	3
10	Ice Rains	4
11	Oboe 2002	2
12	Echo Pan	2
13	Bell Swing	3
14	Reso Synth	2
15	Steam Pad	3
16	VibeString	4
17	Syn Lead 1	4
18	Syn Lead 2	2
19	Syn Lead 3	2
20	Syn Lead 4	2
21	Syn Bass 1	3
22	Syn Bass 2	2
23	Syn Bass 3	2
24	Syn Bass 4	3
25	AcouBass 1	2
26	AcouBass 2	1
27	ElecBass 1	2
28	ElecBass 2	2
29	SlapBass 1	2
30	SlapBass 2	3
31	Fretless 1	4
32	Fretless 2	2
33	Vibe	2
34	Glock	3
35	Marimba	3
36	Xylophone	2
37	Guitar 1	3
38	Guitar 2	3
39	Elec Gtr 1	4
40	Elec Gtr 2	4
41	Koto	2
42	Shamisen	2
43	Jamisen	2
44	Sho	4
45	Shakuhachi	4
46	WadaikoSet	4
47	Sitar	4
48	Steel Drum	4
49	Tech Snare	4
50	Elec Tom	4
51	Revrse Cym	2
52	Ethno Hit	4
53	Timpani	2
54	Triangle	2
55	Wind Bell	3
56	Tube Bell	4
57	Orche Hit	4
58	Bird Tweet	1
59	OneNoteJam	4
60	Telephone	1
61	Typewriter	2
62	Insect	2
63	WaterBells	3
64	JungleTune	4

Roland

D-5 Preset Tones

r GROUP

No.	Tones	Number of Partials
01	Closed High Hat－1	1
02	Closed High Hat－2	1
03	Open High Hat－1	2
04	Open High Hat－2	2
05	Crash Cymbal	2
06	Crash Cymbal (short)	1
07	Crash Cymbal (mute)	1
08	Ride Cymbal	2
09	Ride Cymbal (short)	1
10	Ride Cymbal (mute)	1
11	Cup	2
12	Cup (mute)	1
13	China Cymbal	2
14	Splash Cymbal	1
15	Bass Drum－1	2
16	Bass Drum－2	1
17	Bass Drum－3	2
18	Bass Drum－4	1
19	Snare Drum－1	1
20	Snare Drum－2	1
21	Snare Drum－3	1
22	Snare Drum－4	2
23	Snare Drum－5	1
24	Snare Drum－6	1
25	Rim Shot	1
26	Brush－1	2
27	Brush－2	2
28	High Tom Tom－1	1
29	Middle Tom Tom－1	1
30	Low Tom Tom－1	1
31	High Tom Tom－2	1
32	Middle Tom Tom－2	1
33	Low Tom Tom－2	1
34	High Tom Tom－3	2
35	Middle Tom Tom－3	2
36	Low Tom Tom－3	2
37	High Pitch Tom Tom－1	1
38	High Pitch Tom Tom－2	1
39	Hand Clap	1
40	Tambourine	1
41	Cowbell	1
42	High Bongo	1
43	Low Bongo	1
44	High Conga (mute)	1
45	High Conga	1
46	Low Conga	1
47	High Timbale	1
48	Low Timbale	1
49	High Agogo	1
50	Low Agogo	1
51	Cabasa	1
52	Maracas	1
53	Short Whistle	2
54	Long Whistle	2
55	Quijada	3
56	Claves	1
57	Castanets	2
58	Triangle	2
59	Wood Block	1
60	Bell	2
61	Native Drum－1	1
62	Native Drum－2	1
63	Native Drum－3	1
OFF		0

i GROUP

No.	Tones	Number of Partials
01	TouchPiano	4
02	Loud Piano	4
03	Syn Piano	4
04	Tapped EP	3
05	E-XPiano	3
06	FulloutOrg	4
07	Moss Organ	4
08	JazzyOrgan	3
09	Warm Pad	4
10	DeepStrngs	4
11	Hollow Pad	4
12	Sfz.Strngs	4
13	Octave Str	3
14	Blow Pipes	3
15	Soft Flute	3
16	Shaku 8	4
17	Brass Pad	2
18	Soft Brass	4
19	Velo Brass	2
20	Touch Horn	2
21	Brass Razz	4
22	Harm Syn	2
23	Squeezzy	3
24	Reso Sweep	2
25	Voxy Men	4
26	Syn Choir	3
27	Harpsi-Vox	2
28	Voxy Women	4
29	GlassVoice	4
30	Poly Synth	3
31	Rich Wood	4
32	Clavitroid	4
33	Thumb Funk	3
34	Funk Bass	2
35	Sync Bass	2
36	Slide Bass	3
37	Mini Bass	3
38	PedalSteel	2
39	Acous Gtr	3
40	PickGuitar	3
41	SynDulciez	4
42	Velo Gtr	3
43	Overdrive	4
44	Distortion	4
45	Saw Lead	2
46	SquareSolo	2
47	Horn Lead	3
48	DoctorSolo	2
49	Mild Bell	2
50	Gruis Bell	4
51	Syn Chime	3
52	Jingle	2
53	Drop Hit	4
54	NativePerc	2
55	Power Kick	1
56	Tek Snare	2
57	Space War	3
58	'Commando'	3
59	Bubble Gum	2
60	LonlyWolf	1
61	Seashore	4
62	CosmicWave	2
63	Efx	2
64	Airport	4

Roland

CONTENTS

[PLAY volume]

Thank you for purchasing the Roland D-5 Multi Timbral Linear Synthesizer.

The D-5, in addition to being used in keyboard performance as a linear synthesizer, can also perform as a multi sound module under the control of a sequencer. To make the best use of this unit, read the owner's manuals (PLAY/ EDIT) carefully.

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For the U.K.

IMPORTANT: THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE.

BLUE : NEUTRAL
BROWN : LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

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INTRODUCTION

BEFORE ACTUALLY PLAYING THE D-5

This section includes important notes and provides a basic explanation of the D-5.

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IMPORTANT NOTES

When employing an AC adaptor, make certain you use only one that has been supplied by the manufacturer. Use of any other power adaptor could result in malfunction or damage.

Concerning the Power Supply

●Whenever you make any connections with other devices, always turn off the power to all equipment first. This will help in preventing malfunction, and damage to speakers.

●Do not force the unit to share the same power outlet as one used for distortion producing devices (such as motors, variable lighting devices). Be sure to use a separate power outlet.

●Before using the AC adaptor, always make certain the voltage of the available power supply conforms to its rating.

●Do not place heavy objects onto, step on, or otherwise risk causing damage to the power cord.

●Whenever you disconnect the AC adaptor from the outlet, always grasp it by the plug, to prevent internal damage to the cord and the hazard of possible short circuits.

●If the unit is not to be used for a long period of time, unplug the cord from the socket.

Concerning Placement

●Avoid using or storing the unit in the following places, as damage could result.
○Places subject to extremes in temperature. (Such as under direct sunlight, near heating units, above equipment generating heat, etc.)
○Places near water and moisture. (Baths, washrooms, wet floors, etc.) Places otherwise subject to high humidity.
○Dusty environments.
○Places where high levels of vibration are produced.

●Should the unit be operated nearby television or radio receivers, TV pictures may show signs of interference, and static might be heard on radios. In such cases, move the unit out of proximity with such devices.

Maintenance

●For everyday cleaning, wipe the unit with a soft dry cloth, or one that is dampened slightly. To remove dirt that is more stubborn, wipe using a mild, neutral detergent. Afterwards, make sure to wipe thoroughly with a soft cloth.

●Never apply benzene, thinners, alcohol or any like agents, to avoid the risk of discoloration and deformation.

Other Precautions

●Protect the unit from strong impact.

●Avoid getting any foreign objects (coins, wire, etc.), or liquids (water, drinks, etc.) into the unit.

●A certain small amount of heat will be radiated from the unit, and thus should not be considered abnormal.

●Before using the unit in a foreign country, check first with your local Roland Service Station.

●At any time that you notice a malfunction, or otherwise suspect there is damage, immediately refrain from using the unit. Then contact the store where bought, or the nearest Roland Service Station.

Concerning Memory Backup

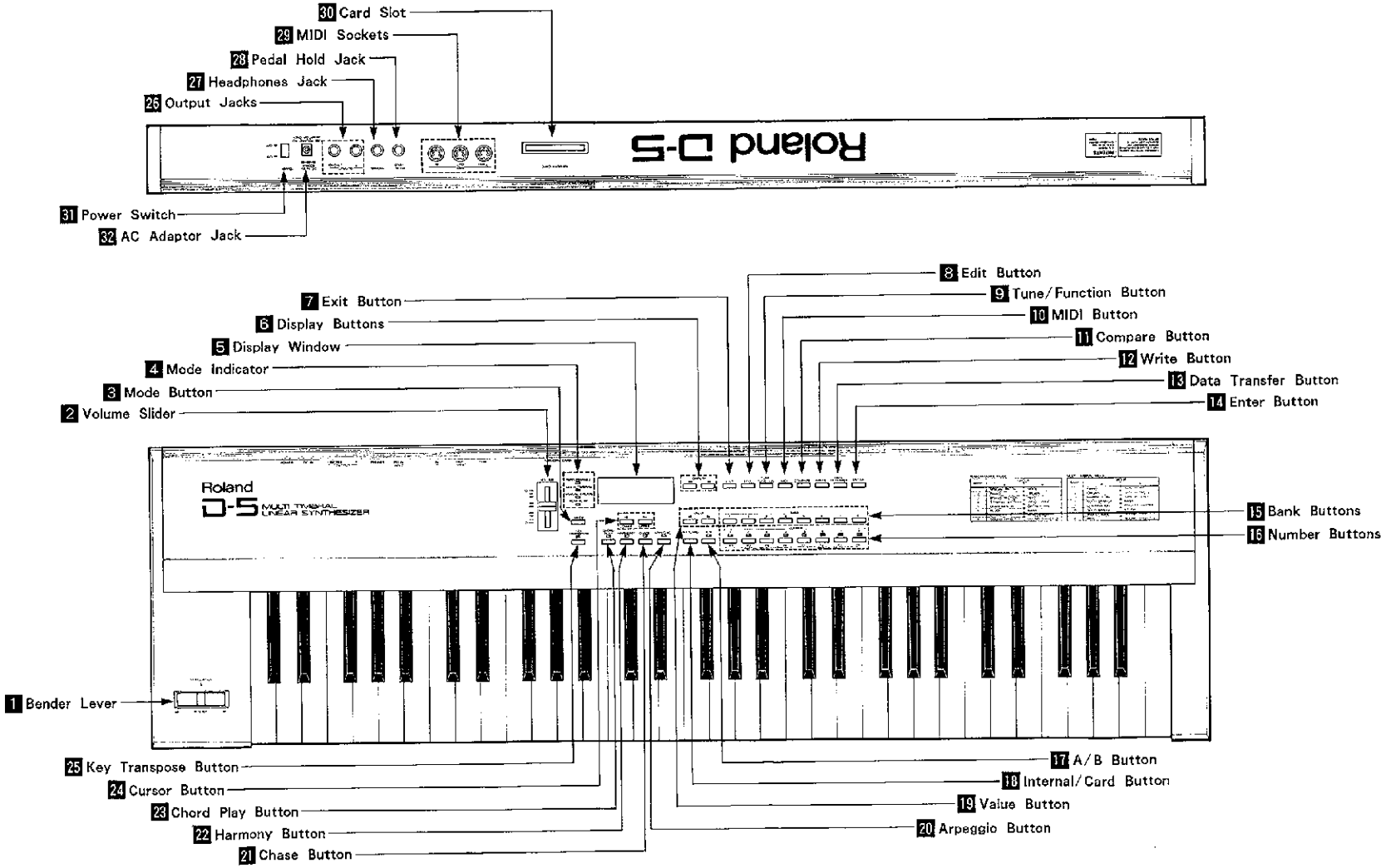
●Within the unit is contained a battery which serves in maintaining the contents of memory while the main power is off. The normal life of this battery is 5 years or more, but it is strongly recommended that you change it every 5 years as a rule. When it is time to change the battery, contact a Roland Service Station.

* The first time you need to change the battery could occur before 5 years have passed.

●When the battery gets weak the following will appear in the display. By this time, it is possible that the contents of memory have already been lost.
"Check Internal Battery"

●Please be aware that the contents of memory may at times be lost; when sent for repairs or when by some chance a malfunction has occurred. Important data should be saved on Memory Card, or written down on paper. During repairs, due care is taken to avoid the loss of data, however, in certain cases, such as when circuitry related to memory itself is out of order, we regret that it may be impossible to restore the data.

PANEL DESCRIPTION



1 BENDER (Bender Lever)
This allows you to increase or decrease the pitch or control vibrato effects.

2 VOLUME (Volume Slider)
This adjusts the overall volume of the D-5, as output from the Output or Headphone jack.

3 MODE (Mode Button)
Press this to change the D-5's Play mode. Each time you press the button, the changes of mode revolve as such : Performance → Multi Timbral → Manual Drums → ROM Play → Performance ....

4 Mode Indicator
A Mode Indicator lights up when the relevant Play mode is selected with the Mode Button.

5 Display (Display Window)
This shows the current condition of the D-5.

6 DISPLAY (Display Buttons)
Use these buttons to change displays. Use [►] button to advance the display and [◄] to reverse.

7 EXIT (Exit Button)
Press this button to return to the Play mode from any other mode.

8 EDIT (Edit Button)
Press this to enter the Editing mode.

9 TUNE/FUNCTION
(Tune/Function Button)
Press this button to change the settings of Master Tune or Memory Protect. (Which parameters can be edited differs depending on the Play mode the D-5 is in.)

10 MIDI (MIDI Button)
Press this button to edit MIDI functions.

11 COMPARE (Compare Button)
Press this to compare the edited data with the original.

12 WRITE (Write Button)
Press this to enter the Writing mode.

13 DATA TRANSFER
(Date Transfer Button)
Press this button to perform data transfer.

14 ENTER (Enter Button)
Press this to execute Editing, Writing or Data Transfer.

15 BANK (Bank Buttons)
In Play mode (Performance / Multi Timbral), these buttons can select a Sound, while they function differently in the other operation modes.

16 NUMBER (Number Buttons)
In Play mode (Performance / Multi Timbral), these buttons can select a Sound, while they function differently in the other operation modes.

17 A/B Button

This selects A or B group for Patches/ Timbres.

18 INT/CARD (Internal/Card Button)

This selects the Internal memory or Card memory.

19 VALUE (Value Button)

Use this to change values of a parameter. Pressing [◄] decreases the value and pressing [►] increases them.

20 ARPEGGIO (Arpeggio Button)

Press this button to turn on or off the Arpeggio effect used in the Performance mode. When the Arpeggio effect is on, the indicator is lit.

21 CHASE (Chase Button)

Press this to turn on or off the Chase effect used in the Performance mode. When the Chase effect is on, the indicator is lit.

22 HARMONY (Harmony Button)

Press this button to turn on or off the Harmony effect used in the Performance mode. When the Harmony is on, the indicator is lit.

23 CHORD PLAY (Chord Play Button)

Press this button to turn on or off the Chord Play function used in the Performance mode. When Chord Play is on, the indicator is lit.

24 ◄/► (Cursor Button)

Use these buttons to select a parameter in the display, etc.

25 KEY TRANSPOSE (Key Transpose Button)

Press this button to transpose the pitch of the keyboard. While the Key Transpose is being performed, the indicator is lit.

26 OUTPUT (Output Jacks)

These are output jacks for connecting to an amplifier, etc. During rhythm performance or Multi Timbral mode, these jacks will output signals in stereo.

27 PHONES (Headphones Jack)

Connect stereo headphones to this jack. Optimum are those of an impedance of from 8 to 150 ohms. Even when headphones are being used, the Output Jacks still send signals.

28 PEDAL HOLD (Pedal Hold Jack)

By connecting an optional pedal switch (DP-2, DP-6) to this jack, the Hold effect can be controlled with the pedal.

29 MIDI Sockets

These sockets are used for connecting MIDI devices.

30 MEMORY CARD (Card Slot)

Connect a RAM or ROM card here.

31 POWER (Power Switch)

This switches the unit on or off.

32 AC Adaptor Jack

Connect an AC adaptor (an accessory) here.

AN OVERVIEW OF THE D-5

Before going on to "Playing the D-5" in the following section, carefully read the following explanation.

1. Features

● LA Synthesis

The D-5 is equipped with sound modules employing LA (Linear Arithmetic) synthesis, widely acclaimed since adoption with the D-50 and D-10. Whether it be the fatter sounds normally associated with analog synthesizers, or the sharp attacks unique to digital synthesis, you now have a great deal of expressive freedom over a wide range of sound creation possibilities.

● Performance Mode and Multi Timbral Mode

The D-5 has two main modes ; Performance Mode and Multi Timbral Mode. The Performance mode is for using the D-5 as a keyboard instrument, while the Multi Timbral mode allows you to enjoy ensemble performances when connected with an external MIDI sequencer.

● Multi Timbral Mode

The Multi Timbral mode turns the D-5 into eight independent synthesizer modules plus a rhythm sound module. The D-5 can play up to 32 voices at the same time, which can be used in any setup you like respective to each module.

● Tones

A Tone is the basic unit of a sound. The D-5's memory stores 128 different Preset Tones, 64 user-programmed Tones, and 63 Preset Rhythm Tones. Also, optional memory cards (M-256D, M-256E) can be used for saving original sound libraries for ongoing use.

● Rhythm Tones

As well as the 63 preset rhythm tones supplied in internal memory, 22 more original rhythm tones you program can be used for the Rhythm section. Each rhythm tone can have different Pan and Level settings as desired, so output at any desired stereo balance is possible.

● Patch Effect Functions

The Performance mode of the D-5 allows you to use the Chord Play, Harmony, Chase and Arpeggio functions which create interesting performance effects. These can be set individually in each Patch, resulting in the optimum effect for each sound.

2. Partials and Maximum Voices

The D-5 can produce a maximum of 32 voices, or more precisely, 32 Partials, at the same time.

A Partial is the smallest unit of sound which goes toward making a Tone within the D-5. Each Tone can consist of from one to four Partials. Quite simple Tones can be made using only 1 Partial, but it is through combining multiple Partials that you are able to obtain a great variety of high-quality sounds.

The maximum number of voices able to be produced simultaneously will differ, depending on the number of Partials that have been set for any chosen Tone. For example, Tones using two Partials provide 16 voices, whereas with Tones using four Partials it would be 8 voice polyphonic.

In the Multi Timbral mode, which allows you to use more than one Tone at the same time, the 32 voices can be assigned as necessary to each sound module (Part), allowing you use voices effectively without wasting them. It is important that you get a good understanding of these concepts concerning sound usage.

3. Using the D-5 Owner's Manuals

There are two separate volumes ; PLAY and EDIT.

PLAY volume

This volume explains how to play the D-5, and other functions including basic editing. There are three sections in the PLAY volume, as follows.

- **Section Ⅰ : Let's Play the D-5**
  This section describes how to use the D-5 on its own ; for instance, power-up, using the performance controlling functions, etc.

- **Section Ⅱ : Performance via MIDI**
  This section describes the basic concept of MIDI and how to use MIDI devices in the Multi Timbral or Performance mode.

- **Section Ⅲ : Let's change the sound**
  This section refers to simple editing for Tones or functions.

EDIT volume

This volume explains all the parameters and procedures necessary for sound creation. An Index is provided for quick access to the desired information. The EDIT volume consists of an Introduction and three Sections as follows.

- **Introduction**
  This provides an outline of the D-5's basic procedures.

- **Section Ⅰ : System Settings**
  This explains basic system settings such as Tune/ Function and MIDI functions.

- **Section Ⅱ : Patch/Timbre Settings**
  This explains editing procedures for Patches and Timbres.

- **Section Ⅲ : Tone Settings**
  This covers editing procedures for Tones, general concepts related to sound, and the key points in sound creation.

MEMO

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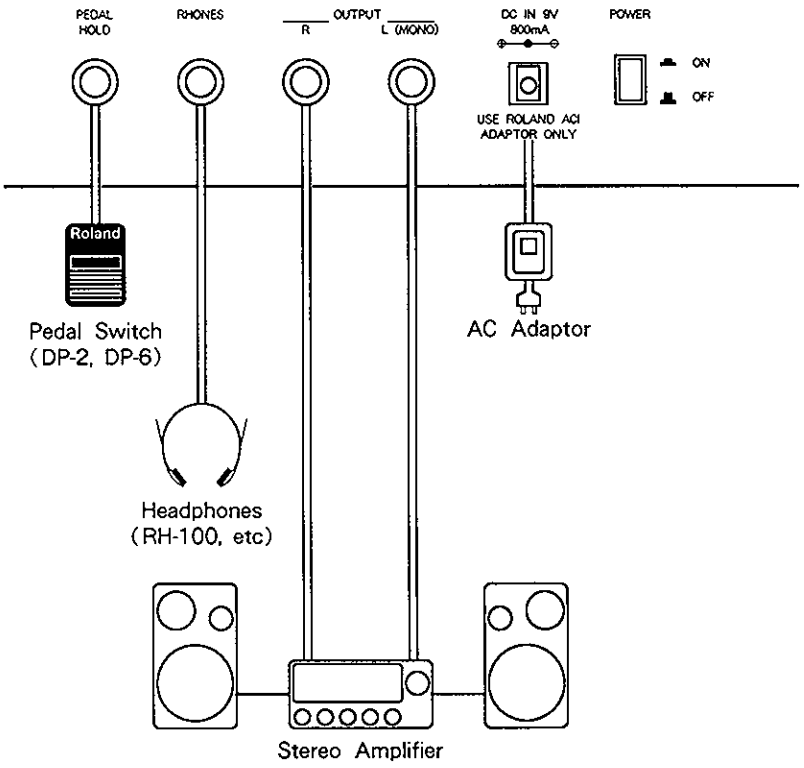
1. Connections

Connect the Output jack on the rear of the D-5 to the Input jack on an amplifier or mixer.

Before connecting the units, switch all the units off. (Otherwise, speaker damage or other malfunction could result.) When using the D-5 for mono output, connect the L (MONO) jack to an external unit. For stereo output, use a stereo amplifier or mixer. To use headphones, connect their plug to the Headphones jack on the rear of the unit.



* The D-5 does not include a power amplifier or speaker, and therefore cannot be played on its own.

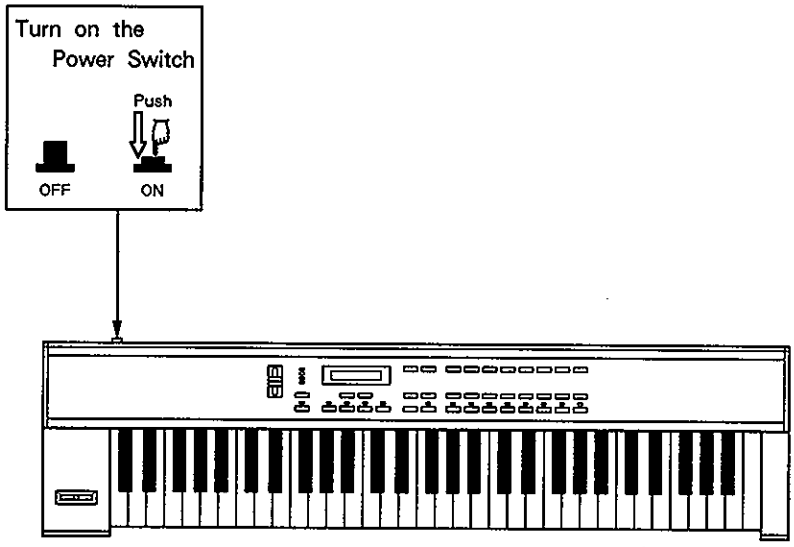
* To make the best use of this unit, use it in stereo.

2. Power-up and Stand-by

Switch on the unit to turn to the stand-by condition.

1 **Make sure that the D-5 is correctly and securely connected to an amplifier, power socket, etc. Then switch on the D-5, then the amplifier.**

Be sure to switch on the amplifier after the D-5.



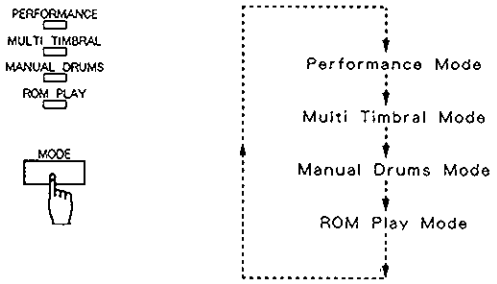
For a few seconds after the unit is switched on, the following display is shown, then it returns to the last-used Playing mode. The D-5 can be played by pressing its keys. However, the sound produced differs depending on what Play mode and sound was previously selected.

* The D-5 does not function for a few seconds after being switched on due to its circuitry protection feature.

* If the D-5 has been previously set to the ROM Play or Manual Drums mode, it will be automatically turned to the Multi Timbral mode when switched on.

2 **Select one of the four Play modes.**

Pressing the **MODE** will change the modes as follows. The Mode Indicator indicates which mode is currently selected.



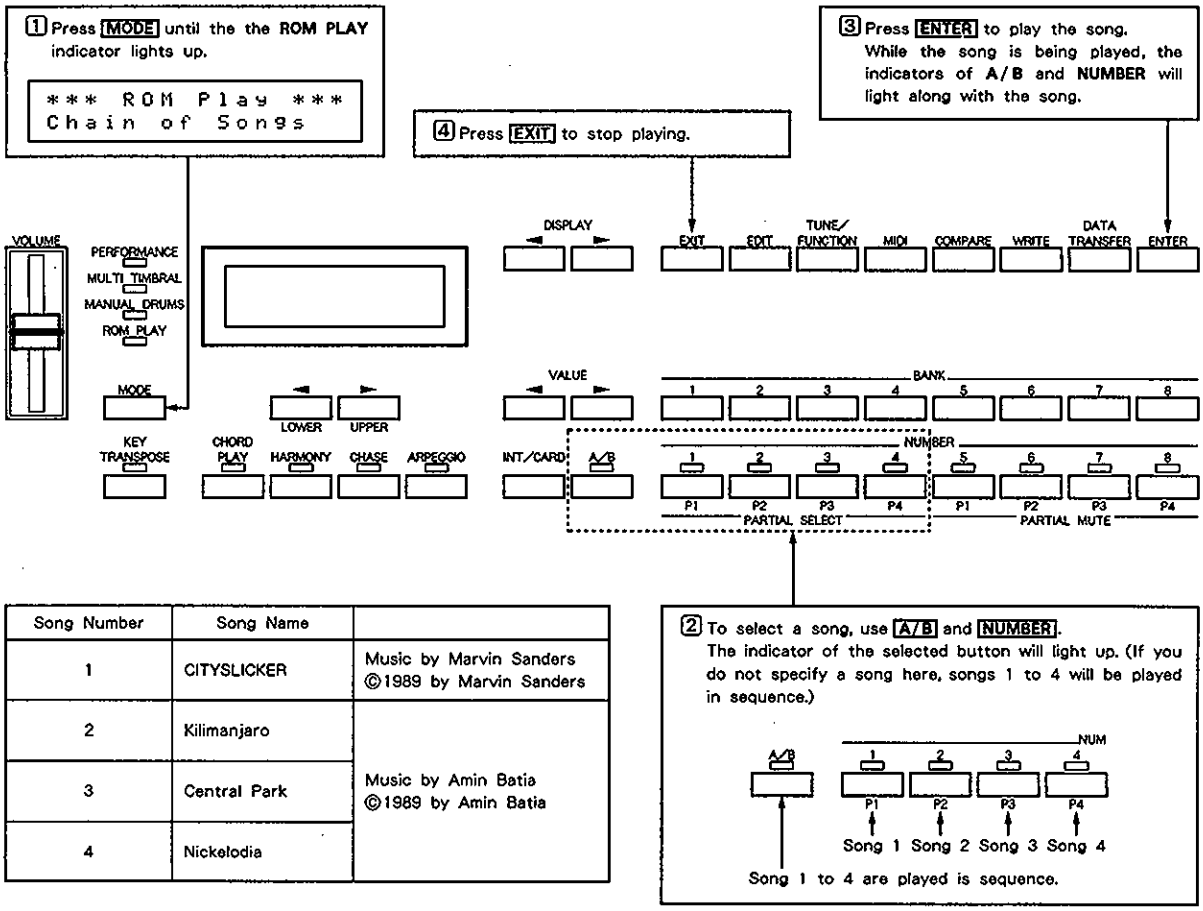
- In the Performance mode, the D-5 can be played as a normal keyboard instrument.
- The Multi Timbral mode turns the D-5 into 8 individual sound modules and a rhythm section, thus making it ideal for use with a MIDI sequencer.

The D-5 also has the Manual Drums mode which allows you to carry out a rhythm performance from the keyboard, and the ROM Play mode, which allows you to hear the demonstration-use preprogrammed data.

3. Let's Listen To the ROM Songs (ROM Play Mode)

Four different songs are preprogrammed in the D-5 so that you can experience the superb effect of the Multi Timbral function. Playing these songs is called ROM Play in this manual.

To obtain the best effect from the Multi Timbral function, use a stereo amplifier, if possible, or use stereo headphones.



Song Number	Song Name	
1	CITYSLICKER	Music by Marvin Sanders ©1989 by Marvin Sanders
2	Kilimanjaro	Music by Amin Batia ©1989 by Amin Batia
3	Central Park	
4	Nickelodia	

* During ROM Play, the keyboard cannot be played and the Bender or other controllers cannot be used.

* The performance data of ROM Play is not sent from the MIDI OUT.

* The D-5 does not feature sequencer function, therefore, to record and playback performance data, you need a MIDI Sequencer.

4. Let's Play Various Sounds

A sound involves not only Tone but also performance controlling elements.

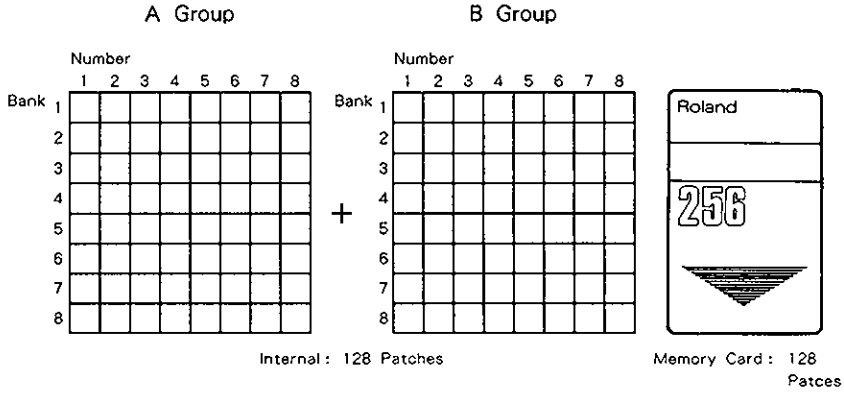
■ Patch and Timbre

In the Performance mode, the combination of Tones and the performance controlling functions that determine how to play Tones is called a Patch. Two Tones (Upper Tone and Lower Tone) are assigned to each Patch. In the Multi Timbral Mode, the same unit is called Timbre, but only one Tone is assigned to each Timbre.

a. Patch selection (Performance mode)

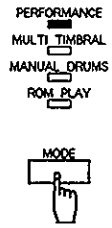
In the Performance mode, you can change sounds by selecting a different Patch.

128 different Patches are stored in the internal memory of the D-5. These Patches are divided into two groups, A and B, and each group contains 64 Patches which are organized according to 8 Banks and Numbers. An optional memory card (M-256D, M-256E) can also store 128 Patches. So, altogether 256 different Patches can be used on the D-5.

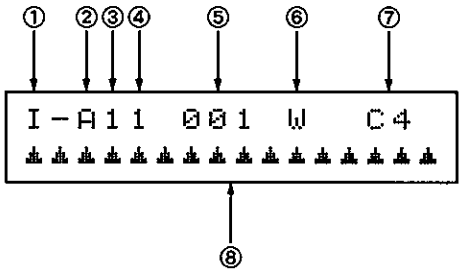


(Preset Patches are shown in "D-5 Patch Sound Chart".)

1 **Make sure that the indicator of PERFORMANCE is lit.**
If the indicator of another mode is lit, press **MODE** until **PERFORMANCE** lights up.



The display shows the previous Patch data selected; before the unit was switched off. Playing the keyboard will play the Patch currently shown in the display.

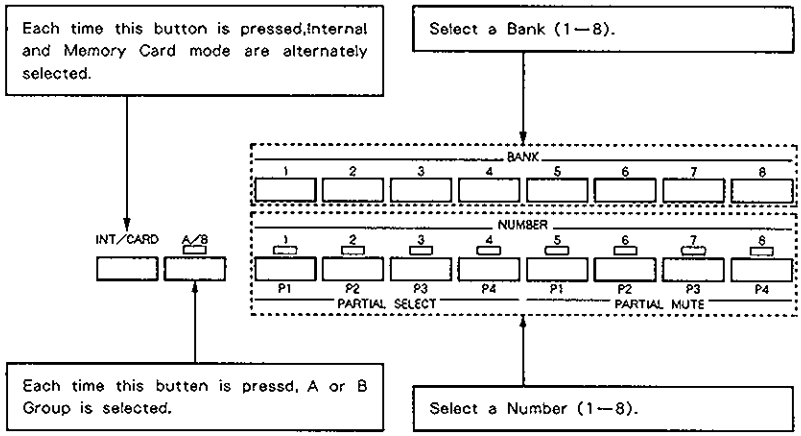


①In the Internal memory mode, "I" appears; and "C" appears in the Card memory mode.
②Group
③Bank
④Number
⑤Program Change Number (Program Change number that corresponds to the Patch currently shown in the display.)
⑥Key Mode (W = Whole, D = Dual, S = Split)
⑦Split Point
⑧Patch Name

* A mark is not indicated at the Patch Name in the actual display.

2 **Select a different Patch and play it.**

When selecting a Patch, be sure to specify the Number after the Bank. If you specify only the Number, the Group or Bank remain intact.

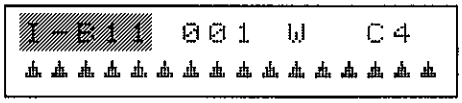

Each time this button is pressed,Internal and Memory Card mode are alternately selected.
Select a Bank (1—8).
BANK
1 2 3 4 5 6 7 8
NUMBER
1 2 3 4 5 6 7 8
INT/CARD
A/B
P1 P2 P3 P4 P1 P2 P3 P4
PARTIAL SELECT
PARTIAL MUTE
Each time this butten is pressd, A or B Group is selected.
Select a Number (1—8).

[EXAMPLE]

Change from Patch I-A11 to I-B31

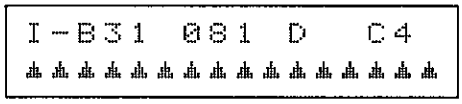
(In this case, both Patches reside in the Internal memory, therefore, you do not need to use **INT/CARD**.)

①Press A/B to change from A to B Group.



②Press BANK 3.

③Press NUMBER 1, and I-B31 Patch is selected.



■Key Mode

Key Mode determines how to output two Tones, Upper and Lower Tones assigned to each Patch.

●WHOLE

Only Upper Tone is played.

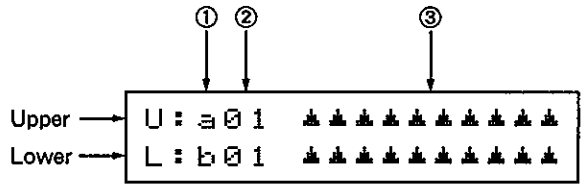
●DUAL

Both Upper and Lower Tones are played at the same time.

●SPLIT

The keyboard is split into two sections at the Split Point. Upper Tone is played in the upper section of the keyboard and Lower Tone is played in the lower section.

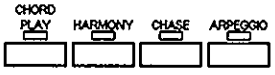
To monitor the Tones, press either of the ◄DISPLAY► buttons once.



①Tone Group
②Tone Number
③Tone Name

■Patch Effects

The Performance mode allows you to use Patch Effects (Chord Play, Harmony, Chase, Arpeggio) which can add interesting effects to the solo or backing performance. ON/Off and setting of each effect can be programmed in each Patch. When you select a Patch, the Effect button of the turned-on effect will light up. If you wish to turn off the effect, simply press the relevant button. See page 35 "Patch Effects" for detailed explanation about using the Patch Effects.



b. Timbre selection (Multi Timbral mode)

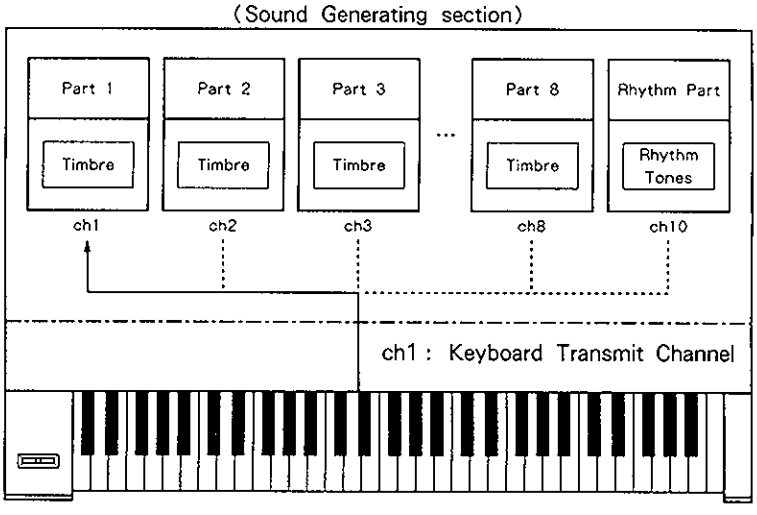
In the Multi Timbral Mode, you can change sounds by selecting a different Timbre. The Multi Timbral mode turns the D-5 into 8 individual sound modules and a rhythm section, and thus may be ideal for ensemble performance using a MIDI sequencer. The following only explains how to change Timbres in each Synthesizer Part. Read page 57 "Effective Use of the Multi Timbral Mode" for the make-up of Multi Timbre and how to use it.

Timbres are arranged in the same way as the Patches in the Performance mode. 128 Timbres are stored in the Internal memory and another 128 on an optional memory card.

■ Basic Concept of the Multi Timbral Mode

The Multi Timbral Mode allows you to assign a desired Timbre to each Synthesizer Part and control each part individually. The Timbre of the specified Part can be played and controlled by the keyboard.

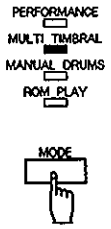
* When shipped, Part 1 is assigned for the keyboard control.



Keyboard Section

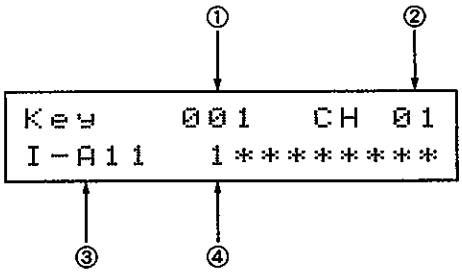
Now, let's play various Timbres.

1 Press [MODE] to turn to the Multi Timbral Mode.



The Multi Timbral Mode has a Keyboard display and Part display (1－8). When you turn to the Multi Timbral Mode from anther mode, the Part display previously used will be called.
In the Keyboard display, you can change Timbres of the Part assigned by the keyboard. The Part display allows you to change Timbres of the Part currently shown.

2 Press [◄/ LOWER] or [UPPER/►] to change to the Keyboard display.



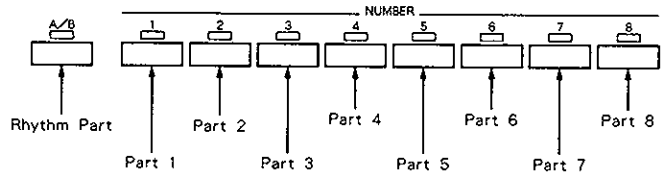
①Program Change Number (the Program Change number that corresponds to the Timbre number shown in the display)
②MIDI Transmit Channel of the keyboard
③Timbre number assigned to the Part (Just like a Patch, it is represented by Internal/Memory Card, Group, Bank and Number)
④Part Number that can be played by the keyboard

3 **Change Timbres.**

Change Timbres in the same way Patches are changed in the Performance mode.

* If you have changed to the Keyboard display after switching the unit on, Timbre number I-A11 is always shown no matter what Timbre is actually assigned to the Part played by the keyboard. That is, the Timbre shown in the display will differ from the one actually played.

The performance status of each Part is shown by the **A/B** and **NUMBER** indicators (the indicator of the Part that is producing sound is lit).



(Preset Timbres are shown in "D-5 Timbre Sound Chart".)

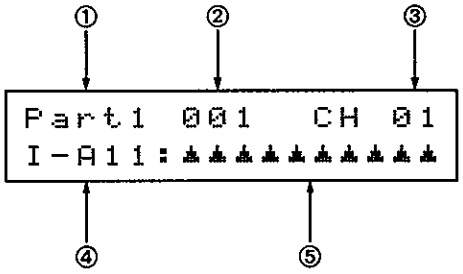
< Changing Timbres of each Part >

To monitor the settings of each Part or change Timbres for each Part, do as follows.

* Playing the keyboard will generate only the Timbre of the Part assigned for the keyboard. Thus, even if you change to the Timbres of other Parts, the sound obtained by playing the keyboard does not change.

* Even if you change the Timbres of the Part playable by the keyboard in the Part display, the Timbre number shown in the Keyboard display does not change.

1 **Select a Part with [◄]DISPLAY[►].**



①Part Number
②Program Change Number (Program Change number that corresponds to the selected Timbre)
③Part Channel (MIDI Receive channel of the Part)
④Timbre Number assigned to the Part
⑤Tone Name assigned to the Timbre

2 **Change Timbres.**

Change Timbres in the same way as changing Patches in the Performance mode.

* Even if you change Timbres in a Part display, Program Change messages will not be transmitted from MIDI OUT.

c. Using a memory card

There are two types of memory cards, ROM and RAM.

■ Difference between ROM and RAM cards

ROM stands for Read Only Memory meaning that it is memory specifically for reading data from. Patch and Timbre data has been written onto a ROM card. Data on a ROM card cannot be edited and is preserved safely unless the card is damaged for some reason. Optional Sound Library (PN-D10-01 etc.) is a ROM card.

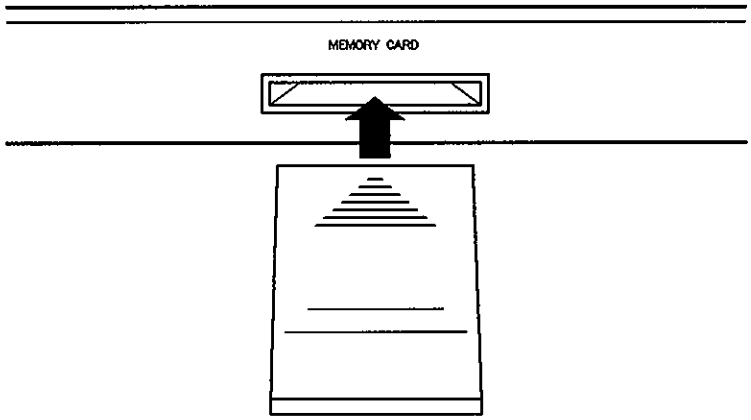
RAM stands for Random Access Memory, meaning that it is memory allowing both reading and writing. Data on a RAM card can be edited as many times as you like. A RAM card contains a battery providing backup of its data. This type of card may be used for saving any Patch/Timbre/Tone data you have programmed. Use only M-256D or M-256E (optional) for the D-5.

* No data is written on a RAM card originally. To use a brand new RAM card, copy the data in the internal memory onto the RAM card as explained on page 120 in the separate volume, EDIT.

* Previously released Sound Library Memory Card for the D-10 and D-20 (PN-D10 Series) is compatible with the D-5. However, data programmed on the D-10/D-20 does not completely match the D-5 (Patch Effects are not included in the D-10/D-20 data, etc.). If you use the D-10/D-20's data (stored on a card) on the D-5 in the Performance mode, the Patch Effects will be automatically set to same in all the Patches. In the Multi Timbral mode, however, you are free from this problem. For details, read "Compatibility with the D-10/D-20" on page 130 in the EDIT volume.

To change Patches/Timbres on a card, do as follows.

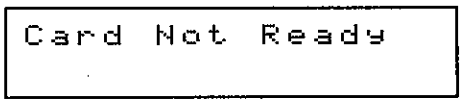
1 Insert a memory card into the Card Slot on the rear of the unit.



* Make sure the card is faced properly, then insert it in the correct direction.

2 Press [INT/CARD] to change to the Card mode.

* If no memory card is inserted or the card is not securely connected, the following message will appear. Press [EXIT] and repeat the procedure.



* If you use a memory card that contains data other than that for the D-5 or D-10/D-20, the following message will appear. Press [EXIT], replace the card with a proper one, and repeat the procedure.

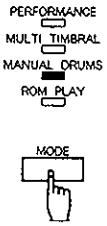
3 Change Patches/Timbres.

Change Patches or Timbres in the same way as in the Internal mode.

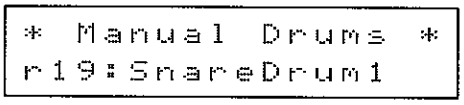
d. Rhythm performance with the keyboard (Manual Drums mode)

You can play rhythms with the keyboard.

1 **Press MODE until the MANUAL DRUMS indicator lights up.**



Now, pressing keys on the keyboard will cause the corresponding rhythm tones to sound. The display indicates the rhythm tone name for the last key pressed.



* The Rhythm Tone assignment to individual keys and the output balance can be changed if you like. See page 114 "Rhythm Tone Setup".

* To transpose the pitch of the keyboard, do as explained on page 41 "Key Transpose".

[Preprogrammed Rhythm Setup]

Rhythm tone (tone No.)		Note number	
Native Drum – 3	(r63)	97	
Native Drum – 2	(r62)	96	C7
Native Drum – 1	(r61)	95	
Ride Cymbaal (short)	(r09)	94	
High Tom Tom – 3	(r34)	93	
Crash Symbal (short)	(r06)	92	
Middle Tom Tom – 3	(r35)	91	
Closed High Hat – 2	(r02)	90	
Low Tom Tom – 3	(r36)	89	
Snare Drum – 6	(r24)	88	
Snare Drum – 5	(r23)	87	
Snare Drum – 4	(r22)	86	
Bass Drum – 4	(r18)	85	
Bass Drum – 3	(r17)	84	C6
Bell	(r60)	83	
Wood Block	(r59)	82	
High Pitch Tom Tom – 1	(r37)	81	
Triangle	(r58)	80	
High Pitch Tom Tom – 2	(r38)	79	
Castanets	(r57)	78	
Brush – 2	(r27)	77	
Brush – 1	(r26)	76	
Claves	(r56)	75	
Cup (mute)	(r12)	74	
Quijada	(r55)	73	
Long Whistle	(r54)	72	C5
Short Whistle	(r53)	71	
Maracas	(r52)	70	
Cabasa	(r51)	69	
Low Agogo	(r50)	68	
High Agogo	(r49)	67	
Low Timbale	(r48)	66	
High Timbale	(r47)	65	
Low Conga	(r46)	64	
High Conga	(r45)	63	
High Conga (mute)	(r44)	62	
Low Bongo	(r43)	61	
High Bongo	(r42)	60	C4
Ride Cymbal (mute)	(r10)	59	
Snare Drum – 3	(r21)	58	
Crash Cymbal (mute)	(r07)	57	
Cowbell	(r41)	56	
Splash Cymbal	(r14)	55	
Tambourine	(r40)	54	
Cup	(r11)	53	
China Cymbal	(r13)	52	
Ride Cymbal	(r08)	51	
High Tom Tom – 2	(r31)	50	
Crash Cymbal	(r05)	49	
High Tom Tom – 1	(r28)	48	C3
Middle Tom Tom – 2	(r32)	47	
Open High Hat – 1	(r03)	46	
Middle Tom Tom – 1	(r29)	45	
Open High Hat – 2	(r04)	44	
Low Tom Tom – 2	(r33)	43	
Closed High Hat – 1	(r01)	42	
Low Tom Tom – 2	(r30)	41	
Snare Drum – 2	(r20)	40	
Hand Clap	(r39)	39	
Snare Drum – 1	(r19)	38	
Rim Shot	(r25)	37	
Bass Drum – 2	(r16)	36	C2
Bass Drum – 1	(r15)	35	

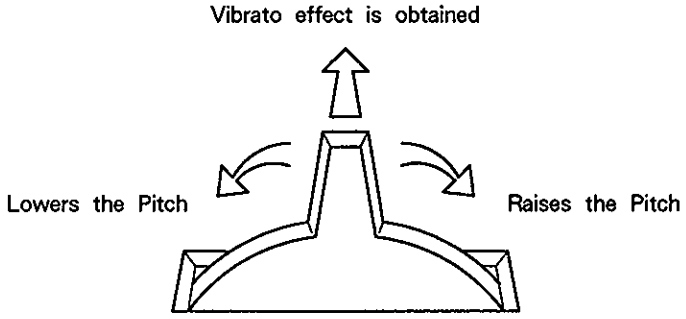
e. Dynamics (Velocity)

The volume or tone changes depending on how you play the keyboard.

* Velocity is the strength (speed) for playing the keyboard. An optimum velocity value is set for each Tone, therefore the effect will vary with each Patch or Timbre.

f. Bender lever (Pitch bend and Modulation)

The Bender Lever will cause pitch change or a modulation effect (vibrato).



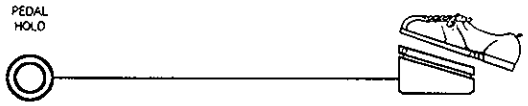
* The depth of pitch change or vibrato effects varies in each Patch and Timbre, as an optimum value is programmed for each Patch and Timbre.

g. Hold pedal

Using an optional pedal switch (DP-2, DP-6), the Hold effect can be controlled with a pedal.

Hold is the effect that sustains the sound even after the key is released, as long as the pedal is pressed.
Connect the pedal switch to the Pedal Hold jack on the rear of the unit.

The sound is sustained as long as the pedal is depressed.



Pedal Switch (DP-2, DP-6)

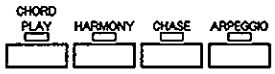
* The Hold effect may not work as you expect in some Patches or Timbres.

* When using the Chord Play, Harmony or Arpeggio funciton (Patch effect), you can sustain the chord with the Hold Pedal.

5. Patch Effects

In the Performance mode, Patch effects (Chord Play/Harmony/Chase/Arpeggio) can be used to add interesting effects to solo or backing performances. The On/Off status and settings for each effect can be programmed in each Patch. This section explains how to use each effect.

If you wish to use any of these effects, simply press the relevant button (the indicator will light up). If you wish to turn off any effect, press the relevant button again (the indicator goes out).
When you select a Patch, the Effect buttons of effects set to on will light up.
Also, when using the Chord Play, Harmony or Arpeggio funciton (Patch effect), you can sustain the chord with the Hold Pedal.



* More than one effect cannot be used at the same time.

* The Patch Effect cannot be obtained by the Note On messages fed into the MIDI IN.

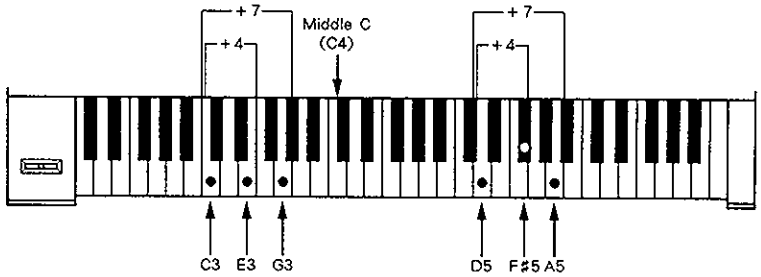
a. Chord play

Chord (Parallel Chord)/Solo Performance.

At the Split Point set in the Patch, you can obtain a chord performance by playing a key on the upper section while playing a chord on the lower section. The chord (the chord pattern played on the lower section) will have the key pressed on the upper section as its root. If you press a key on the upper keyboard without playing a chord on the lower keyboard, only one note is played for solo performance. If you play only the lower keyboard, no sound is generated.
The same Chord Play effect can be obtained in any Key Mode.

[EXAMPLE]

Press D5 key on the upper keyboard while playing a C chord on the lower keyboard, and a D chord will be played. (Split Point : C4)



* A chord is determined by the C3 key. For instance, if you play the D chord on the lower keyboard and press the C key on the upper, the D chord will be created.

Using this function, you can play the top of a song in solo on the upper keyboard and play a chord for backing, or enjoy a fat sound solo on the upper keyboard while pressing octaves on the lower keyboard, etc.

[HOW TO USE THE HOLD PEDAL]

Press the Hold Pedal while playing a chord on the lower keyboard, and the chord can be sustained even after releasing the keys. If you keep holding the Hold Pedal down, an appropriate chord will be automatically played simply by pressing a key on the upper keyboard.

* If you change chords while holding the Hold Pedal down, the sounds will be mixed causing a strange result. To change chords, turn the Hold off (release the pedal) once.

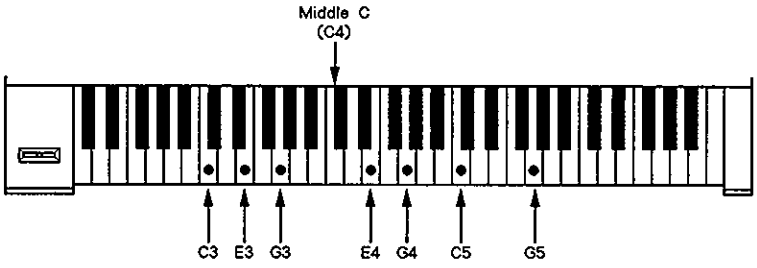
b. Harmony

This effect adds harmony to the melody line.

At the Split Point set in the Patch, you can obtain a harmony by playing a key on the upper section while playing a chord on the lower section. The harmony (an inversion of the chord played on the lower keyboard is added) will have the key pressed on the upper section as a top note. If you press a key on the upper part of the keyboard without playing a chord on the lower section, only one note is played, for use in solo performance. If you play only the lower section, no sound is generated. The same Harmony effect can be obtained in any Key Mode.

[EXAMPLE]

Press G5 key on the upper section while playing a C chord on the lower part of the keyboard, and a harmony that includes G5 as a top note is played. (Split point : C4)



By pressing a different key on the upper part of the keyboard, the harmony will be inversed as follows :

(E4,G4,C5) G5 → (G4,C5,E5) A5 → (C5,E5,G5) B5 → (C5,E5,G5) C6

The key pressed on the upper section

Harmony

* When the Key Mode is Split, the top note is played with an Upper Tone and harmony is played with a Lower Tone.

* It is possible to set the volume balance of the top note and harmony for each Patch. See page 96 "Harmony Balance".

[HOW TO USE THE HOLD PEDAL]

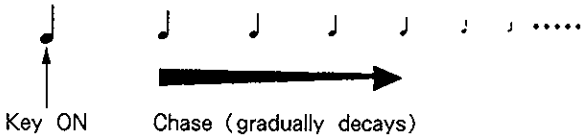
Press the Hold Pedal while playing a chord on the lower keyboard, and the chord can be sustained even after releasing the keys. If you keep holding the Hold Pedal down, the harmony chord will be automatically played simply by pressing a key on the upper keyboard.

* If you change chords while holding the Hold Pedal down, the sounds will be mixed causing a strange result. To change chords, turn the Hold off (release the pedal) once.

c. Chase

Delay – like effect is obtained.

A sound is repeated several times, like echoes, and gradually decays.



The rate of the Chase can be controlled with ◄VALUE► even during playing.

* A different Chase effect can be set in each Patch. For details, see pages 90, 94, and 96 .

* When the Key Mode is set to Split, the Chase effect is obtained only in Upper Tones.

d. Arpeggio

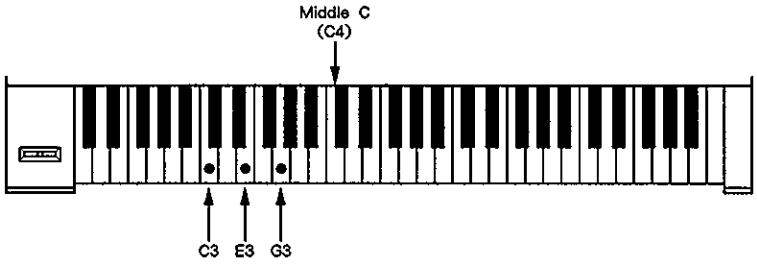
Playing a chord will create an Arpeggio.

The Arpeggio effect is obtained on the entire keyboard range when the Key mode is set to the Whole or Dual. When it is set to the Split, the Arpeggio is obtained only on the Keys played on the lower keyboard.

Performance patterns of the arpeggio will differ depending on the Arpeggio Mode of each Patch.

[EXAMPLE]

Play a chord on the keyboard, and keys are played in the sequence of C3, E3, G3, C3, E3, G3, and so on according to the setting (Arpeggio Mode) of the selected Patch. (Split Point : C4, Arpeggio Mode : UP)



The rate of the Arpeggio can be controlled with ◄VALUE► even while playing.

* A different Arpeggio effect can be set in each Patch. For details, see page 90 and 91.

[HOW TO USE THE HOLD PEDAL]

Press the Hold Pedal while playing a chord, and the Arpeggio will be performed even after releasing the keys.

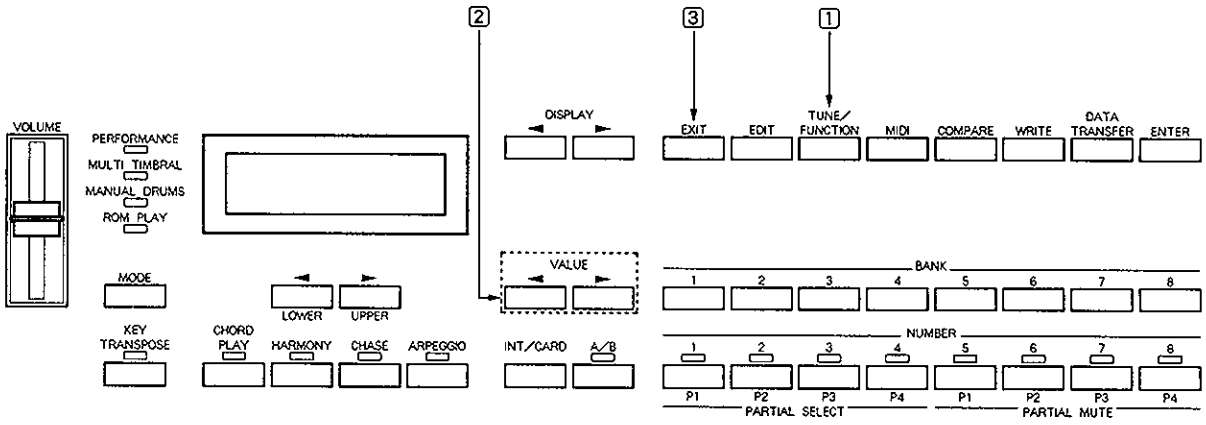
* If you change chords while holding the Hold Pedal down, the sounds will be mixed causing a strange result. To change chords, turn the Hold off (release the pedal) once.

6. Tuning and Key Transpose

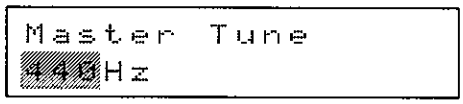
Master Tune allows you to tune the D-5 to another musical instrument. Key Transpose allows you to shift the pitch of the entire keyboard.

■ Master Tuning

The Master Tune function tunes overall pitch of the D-5. The Master Tuning you have set will be retained even after the unit is switched off.



1 **Press [TUNE/FUNCTION].**
The Pitch of the A4 key is shown in Hz.



2 **Change pitches using [◄VALUE►].**
The Pitch can be set from 428 to 453Hz. The number in the display changes in 1Hz steps, but the pitch actually changes almost continuously.

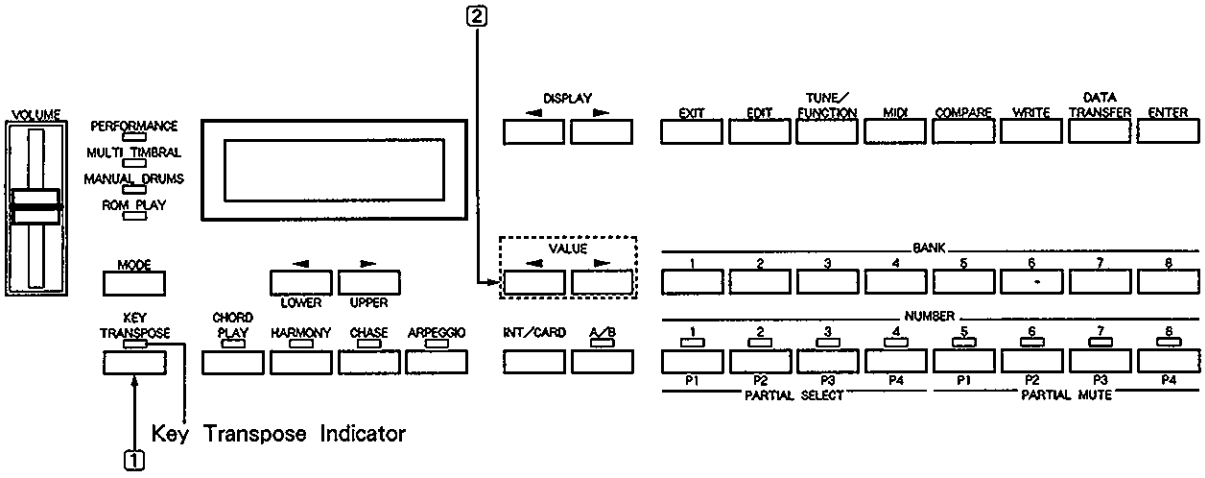
3 **When you have finished tuning, press [EXIT] to return to the previous display.**

* Master Tuning is set commonly for the Performance mode and Multi Timbral mode.

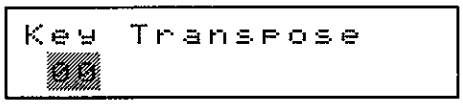
* The Pitch of some Tones (PCM type sounds) may not be affected by Master Tuning.

■Key Transpose

Key Transpose allows you to shift the pitch of the entire keyboard in semitone steps. Using this function, the keyboard can be played in a different key without actually changing the keys.
The Key Transpose you have set will be retained even after the unit is switched off.



1 **Press [KEY TRANSPOSE].**
While holding the button down, the display shows as below.



2 **While holding [KEY TRANSPOSE] down, change values using [◄VALUE►].**
Transposition can be set from −12 to +12 (from −1 to +1 octave in semitone steps).

3 **When you have finished transposition, release [KEY TRANSPOSE].**
When any transposition is made (when you set a value other than 00), the **KEY TRANSPOSE** Indicator on the front panel lights up.

* Key Transpose is set commonly for the Performance mode and Multi Timbral mode.

MEMO

SECTION II

PERFORMANCE VIA MIDI

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1 WHAT IS MIDI?

This section provides a basic explanation of MIDI for using the D-5 with other MIDI – equipped units, such as sequencers, rhythm machines, synthesizers, etc. If you are not very familiar with MIDI, read this section first, then go to "2 Effective Use of the Multi Timbral Mode" (page 57).

1. Conversation Between Musical Instruments

MIDI (Musical Instrument Digital Interface) is an international standard for communicating various messages such as musical performance messages. Via MIDI, instruments from different manufacturers or different types of equipment can communicate freely just by being connected by cable.

Information about performance events, such as pressing/releasing keys or pedals constitute MIDI messages. Playing an instrument will output the relevant MIDI messages. MIDI instruments that recognize these messages will then play as if they were actually being manually played.

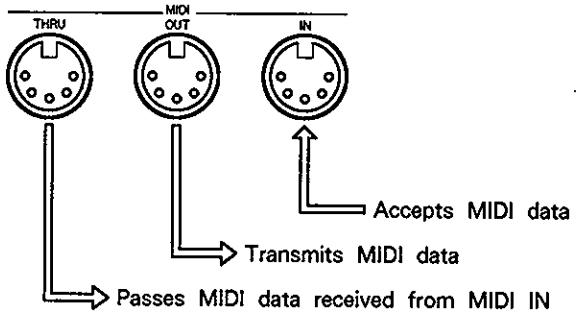
2. What Makes MIDI Conversation Possible

This explains how MIDI messages are sent and received.

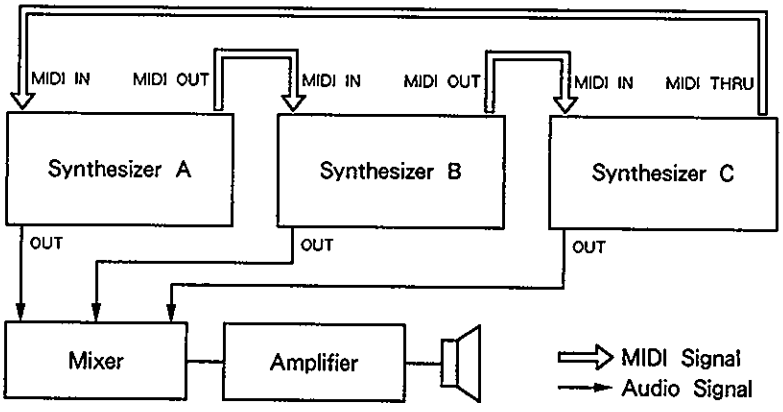
a. MIDI sockets

MIDI messages are handled fully digitally. That is why many kinds of messages can be sent using only one cable.

A device featuring MIDI usually has three sockets; MIDI IN, MIDI OUT and MIDI THRU. MIDI messages travel between one MIDI unit and another through these MIDI sockets, and their interconnecting MIDI cables.



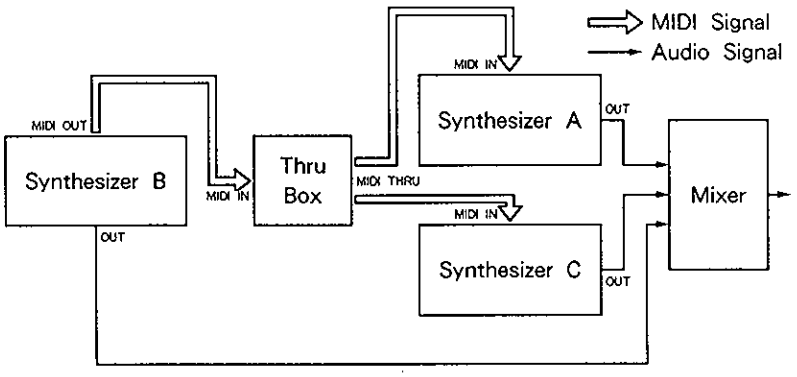
For instance, consider three MIDI synthesizers that are connected as shown below.



When synthesizer A is played, its performance information is sent from its MIDI OUT. Synthesizer B will play based on the messages it receives from A. However, synthesizer C will not play since it is connected to the MIDI OUT of synthesizer B. This is because messages fed into MIDI IN are not output again from MIDI OUT. So, when playing A only the two, A and B, will play at the same time.

On the other hand, when synthesizer B is played, it will transmit the information from its MIDI OUT, causing synthesizer C to play. And, an exact copy of the signal fed into the MIDI IN of C will be sent out from MIDI THRU, passing the information on to synthesizer A. Consequently, playing synthesizer B will cause all three synthesizers to play at the same time. By connecting MIDI instruments consecutively, with MIDI IN going to MIDI THRU to MIDI IN to MIDI THRU and so on, many numbers of instruments can be played, theoretically. This type of connection is called a series connection. However, in practice, it will cause delays or sound deterioration, particularly on instruments connected further down the line. The maximum number of instruments able to be connected may be 4 or 5.

If you wish to connect more than four instruments, use a MIDI THRU Box to divide the MIDI signal and send it to individual instruments. This kind of connection is called a star connection.



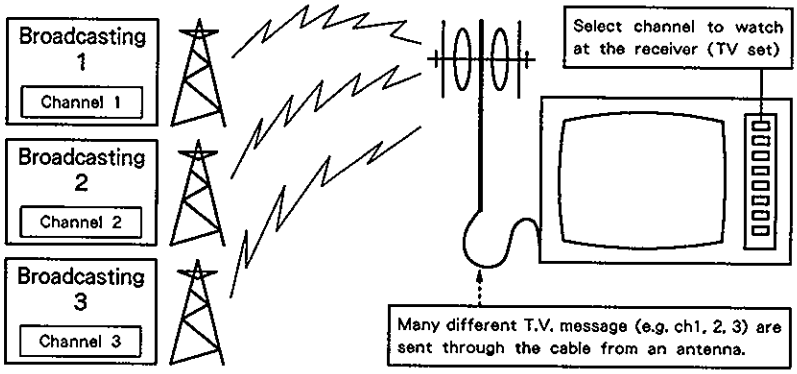
THRU Box : It has more than one THRU socket (normally four) for one MIDI IN. Used for distributing MIDI signals.

Next, if you play synthesizer C, the information of C is not transmitted because the MIDI OUT of C has no cable connected. That is, only synthesizer C will be played.

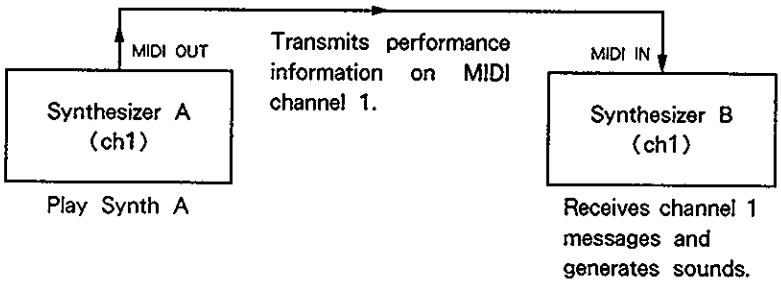
b. MIDI channel

MIDI can send different messages to more than one instrument using only one cable. MIDI channels allow this to take place.

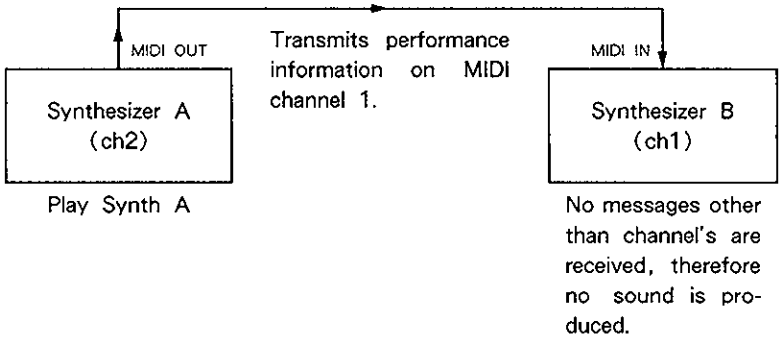
MIDI channels are similar to TV channels, in that they allow you to change channels to select desired programs. Only when the channel number of a transmitter matches that of a receiver are the messages communicated. Sixteen MIDI channels, 1 to 16, are provided. Most MIDI instruments provide means for selection for any of the 16 MIDI channels.


Broadcasting 1
Channel 1
Broadcasting 2
Channel 2
Broadcasting 3
Channel 3
Select channel to watch at the receiver (TV set)
Many different T.V. message (e.g. ch1, 2, 3) are sent through the cable from an antenna.

●When the MIDI channel of the transmitter is set to the same number as the receiver



●When the MIDI channels of the transmitter and receiver are different



■ Mode

As mentioned before, it is necessary to use the same MIDI channel on transmitter and receiver units to play in unison, but there is another way to make the receiver receive the information. This mode is called "OMNI ON", and forces the receiver to respond to all 16 MIDI channels at once.

There are also "POLY" and "MONO" modes in MIDI , which decide whether the information is to be sent as "monophonic" information or "polyphonic".

Polyphonic :

In this mode, more than one note is played at the same time. Using this mode, you can play chords.

Monophonic :

In this mode, only one note is played even if several keys are pressed at the same time. If you press the next key while a note is still playing, the current note is replaced with the next one. This may be used for creating nuance of monotone instruments, such as a wind instrument.

To choose whether to use POLY, MONO or OMNI, MIDI provides 4 possible modes.

①MODE 1 : OMNI ON, POLY

Receive → Receives the information on all channels and plays in polyphonic.

Transmit → Transmits the information on the set MIDI channel.

* Some MIDI devices default to this mode upon startup.

②MODE 2 : OMNI ON, MONO

Receive → Receives the information on all channels but will only play one note at a time.

Transmit → Transmit the information in monophonic on the set MIDI channel.

* This mode is somewhat specialized, and not often used.

③MODE 3 : OMNI OFF, POLY

Receive → Receives only on the chosen MIDI channel and plays in polyphonic.

Transmit → Transmit the information on the set MIDI channel.

* This mode is often employed by most current synthesizers.

④MODE 4 : OMNI OFF, MONO

Receive → Receives the information on Specific MIDI channel(s), and will only play one note per channel.

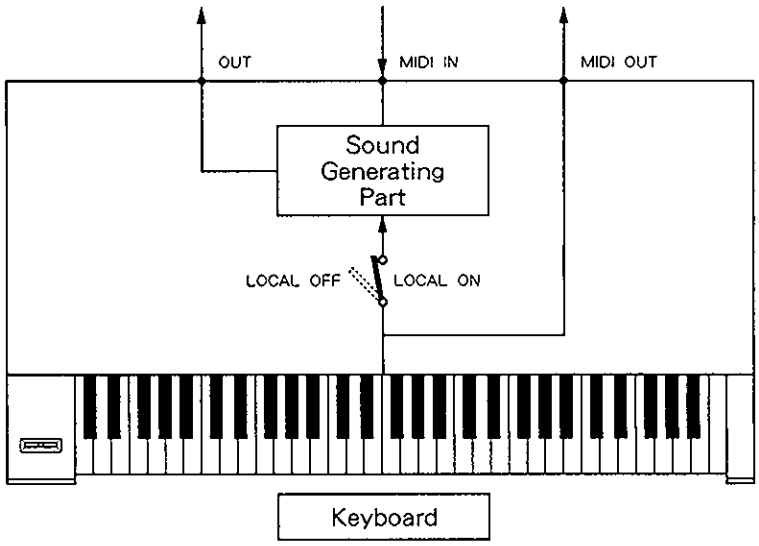
Transmit → Transmits the information on specific MIDI channel(s) and will play only one note per channel.

* This mode is used for controlling several monophonic synthesizers with one polyphonic master keyboard ; or with guitar synthesizers.

c. Local control

The Local Control function can separate the keyboard section from the sound module section within a MIDI instrument.

The basic structure of synthesizers includes the keyboard section and the sound generating part. The information generated by the keyboard usually goes to the sound generating part to play a sound (Local On). This connection is broken if the Local switch is OFF. However, even if LOCAL is Off, the MIDI OUT connection will still operate, and also the information received through MIDI IN will still play the internal sound generator.
LOCAL Off is convenient when controlling the synthesizer from an external controller as a sound module, or using only the keyboard section as a MIDI keyboard controller.



d. Rhythm performance and MIDI

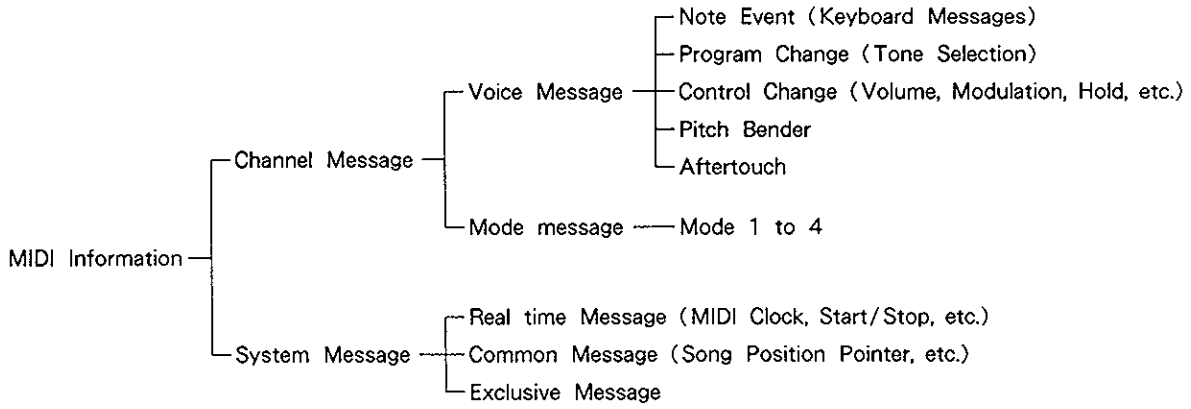
The D-5 includes a rhythm module which can be played with the keyboard, but may be more effectively played by a sequencer or rhythm machine.

Drum modules usually use more voices than synthesizers at the same time. That means, 16 MIDI channels are not sufficient individual assignment of the drum voices. Because each drum voice does not require a sound range as wide as a synthesizer, it is wiser to assign each drum voice to a note number (key number).

Note numbers are numbers used for specifying pitches on a synthesizer. The C-1 to G9 keyboard is divided into 128 keys and note numbers are assigned to these keys, starting from the lowest. In this way, many numbers of rhythm voices can be used at the same time on one MIDI channel.

3. Main Contents of MIDI Information

MIDI information is divided into "Channel Messages" that have MIDI channels, and "System Messages" that control the entire system regardless of MIDI channels. Also, "Channel Messages" is divided into "Voice Messages" which are keyboard performance messages and "Mode Messages" that control the communication Modes.



a. Keyboard messages (Note messages)

Note messages are the most basic information that include which key (Note Number) was pressed (Note ON), how hard it (Velocity) was pressed, and when it was released (Note OFF).

A different rhythm voice is used for each Note Number in a rhythm module.

b. Tone selection (Program change messages)

A Program Change is used to cause the receiver unit to change its sound. On the D-5, it is used in the Performance mode or Multi Timbral mode to change Patches or Timbres. A Program Change number is set for each Patch/Timbre. A Program Change sent from an external device changes Patches/Timbres on the D-5, and also Changing Patches/Timbres on the D-5 causes the sounds on the external device.

The Program Change number assignment differs depending on the manufacturer or type of the instrument.

c. Control change messages

A Control Change can add subtle nuance to a performance, things like Modulation (i.e. vibrato and tremolo), Pitch Bender and Aftertouch. These messages are not used in all MIDI instruments. Study them using the MIDI implimentation chart of each instrument.

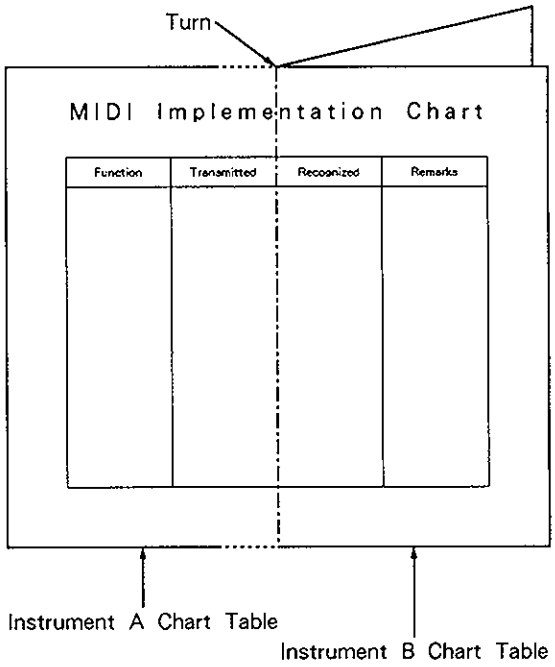
d. System exclusive

System Exclusive messages are messages that are exclusive to a particular manufacturer.
Each manufacturer has an "ID Number" which their instruments will recognize. Any system exclusive data received that has the wrong ID Number will be ignored by the unit receiving it. With Exclusive Messages, it is possible to transfer data between two units of the same model, or to save data into a sequencer (one that recognizes System Exclusive).

4. MIDI Implementation Chart

Refer to the D-5's MIDI implementation chart at the back of the EDIT volume. Although MIDI made it possible for a wide variety of instruments to communicate, this does not mean that all instruments will understand the entire MIDI language. So, in a multi-instrument MIDI system, you will need to check what information each instrument can send and receive. To allow quick check of this information, each instrument has a "MIDI Implementation Chart" in its owner's manual.

On the left hand side of the chart, various types of MIDI message names are listed. The transmit/receive column shows the capacity of the instrument to transmit or receive that data using "○" for yes and "×" for no. Those messages forwhich on both units "○" is indicated can be used. If its capability depends on other factors, the additional information will also be shown.



Contents of the Chart

●Basic Channel

This indicates how many MIDI channels can be set. If "memorized" is not written in the column, the unit is returned to the default channel once it is switched off.

●Mode

There are 3 items for Mode : Default, Messages, and Altered.

Default : This shows the mode selected when the unit is switched on.

Messages : This shows if it is possible for the instrument to receive Mode messages ; or after having received a mode message if it is possible to still change modes.

Altered : This column is only used for instruments that can receive messages which will switch the instrument to a special mode.

See page 48 "Mode" for detailed explanation about the Mode.

●Note Numbers

This row shows the note range over which the instrument can receive or transmit. Note number 60 corresponds to middle C (C4). The "True"column shows the actual sound range to be played.

●Velocity

There are [Note ON] and [Note OFF] rows for velocity. The columns shows whether the instrument can transmit or receive these two velocities. It represents just the speed of the respective note on or off. It does not represent the actual note on or off capability. If there is an "×" in either column, it does not mean that the instrument cannot recognize a note on or off.

●Aftertouch

This shows if the instrument can receive/transmit aftertouch information. The two rows refer to channel aftertouch (one value per MIDI channel) and polyphonic aftertouch (separate aftertouch for each key).

●Pitch Bender

This shows whether or not the instrument can receive/ transmit pitch bender information.

●Control Change

This row shows whether or not the instrument can transmit/ receive controls like modulation, hold or expression. It also shows what can be controlled by each Control number. These controls are particularly important when connecting two different instruments.

●Program Change

This row shows whether or not the instrument can transmit/receive program change information, and what number is used. Program change number assignments to sounds differ for each model.

●Exclusive

This row shows what the instrument can transmit/ receive using the Exclusive messages.

●Common

This section is for sequencer based MIDI systems. It indicates if the instrument will understand MIDI Song Position Pointer, by which the instrument can determine from which bar to start playing ; and MIDI Song Selection, to decide which song to play, etc.

●Real Time

This row shows transmitting/receiving information for synchronizing to a sequencer or rhythm machine via MIDI. "Clock" and "Command" information is used for the instrument to understand when it should start/stop/ continue, etc.

●Aux Messages

This row is used to display whether the instrument is capable of receiving information that will help it to avoid any MIDI problems.

2 EFFECTIVE USE OF THE MULTI TIMBRAL MODE

This section explains how to use external MIDI devices effectively in the Multi Timbral Mode. It will help you understand what you can achieve using your MIDI devices.

1. What is the Multi Timbral Mode?

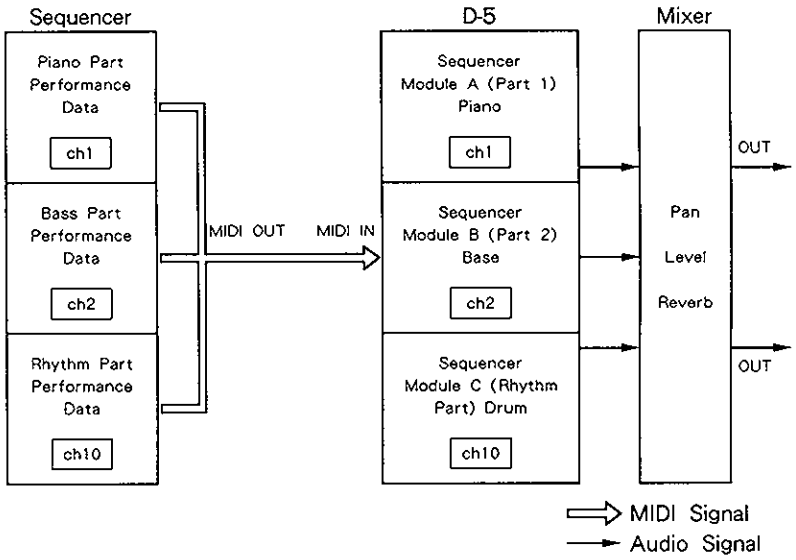
In the Multi Timbral mode, you can connect the D-5 with a sequencer and enjoy ensemble type performances.

a. Use of the Multi Timbral function

The Multi Timbral function turns the D-5 into eight individual synthesizer modules and a rhythm module, and includes a mixer and keyboard.

Usually, an ensemble performance is created by playing several parts simultaneously with different musical instruments, such as bass, guitar, piano, drums and so on. The D-5's Multi Timbral mode allows you to assign desired instrument voices to the eight synthesizer modules. The assigned instrument voices can be played by sending necessary performance information using a MIDI sequencer.

For example, to control three synthesizer modules ; A (piano), B (bass), and C (drum) with a MIDI sequencer, do as follows.
Set the MIDI channel, instrument voice, sound range (Key Shift) and bender range, etc. for each synthesizer module. Then set the level and panning, and effects such as reverb if necessary.
Record performance data in the MIDI sequencer beforehand respective to each MIDI channel. Then, playing the sequencer will send performance data over the individual MIDI channels, making the corresponding modules (piano, bass and drum) play at the same time.



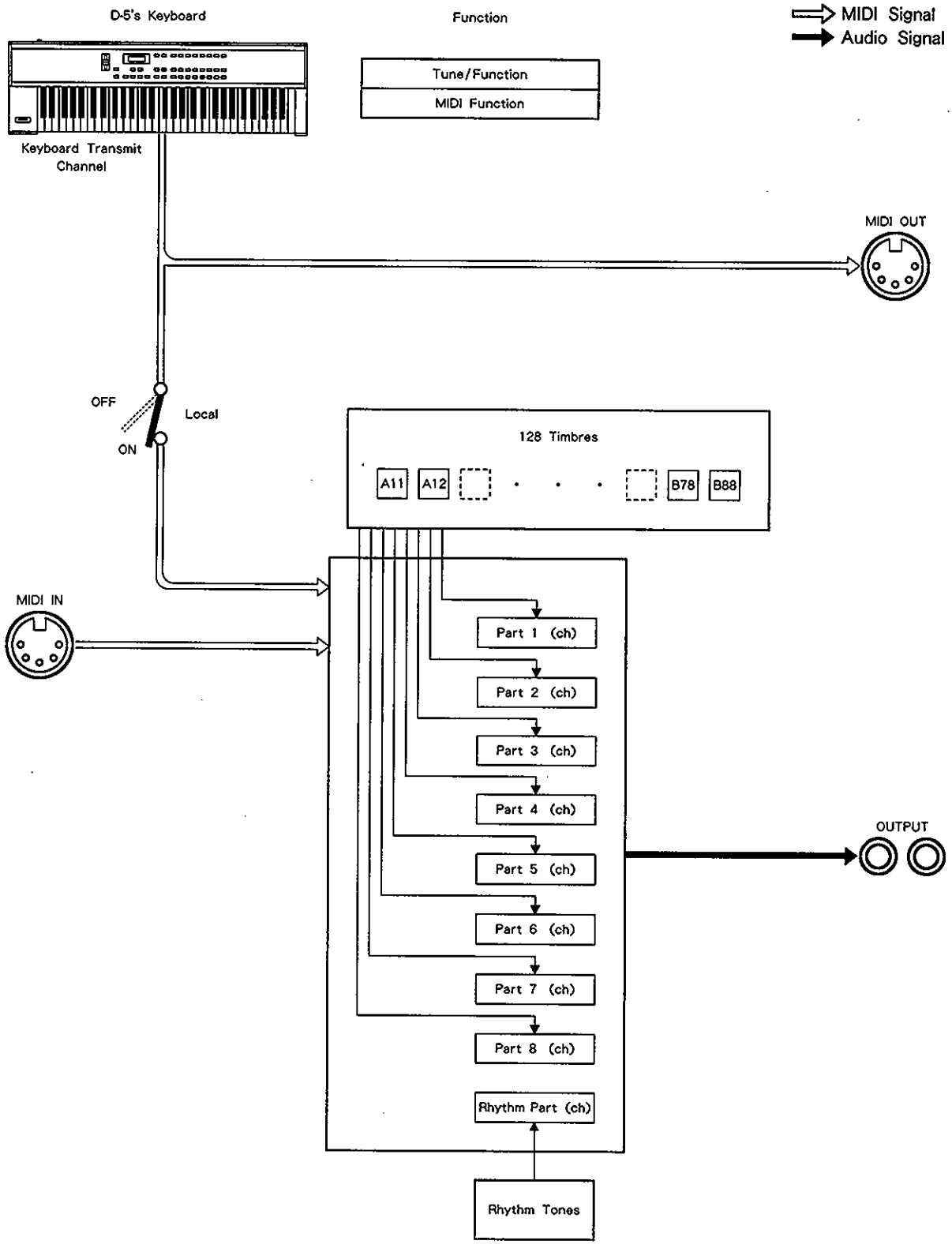
Each synthesizer module is called a Part, and the instrument voice used in each Part is called Timbre in the D-5. You can set MIDI channel, pan and level (like mixer's) for each Part. A Timbre is made of a Tone (basic sound) and parameters that determine how to play the Tone.

In the above example, the D-5 is played using only a MIDI sequencer, but it is also possible to play the keyboard along with the sequencer's performance by using another Part.

b. Flow of the MIDI messages

Each Part of the D-5 works just like a synthesizer module, and the keyboard section can be considered as an independent controller.

In the Multi Timbral mode, the D-5 is divided into eight Synthesizer Parts, a Rhythm Part and Keyboard Controller blocks. These blocks can be considered as connected via MIDI.


D-5's Keyboard
Function
MIDI Signal
Audio Signal
Tune/Function
MIDI Function
Keyboard Transmit Channel
MIDI OUT
OFF
ON
Local
128 Timbres
A11
A12
B78
B88
MIDI IN
Part 1 (ch)
Part 2 (ch)
Part 3 (ch)
Part 4 (ch)
Part 5 (ch)
Part 6 (ch)
Part 7 (ch)
Part 8 (ch)
Rhythm Part (ch)
OUTPUT
Rhythm Tones

● Parts 1—8

MIDI channel, pan and level can be set for each Part. Any one of the 128 Timbres can be assigned to each Part. Only one Timbre can be assigned to a Part, but the Timbre in each Part can be changed to another freely. Each Part can be played by Note On messages ; or controlled by Program Change, and Control Change messages, etc sent from the D-5's internal keyboard or through MIDI IN. More than one Part can be used at the same time by sending messages simultaneously to the individual MIDI receive channels of the Parts you wish to use.

● Rhythm Part

A MIDI receive channel can be set to the Rhythm Part as well. Also, selection can be made of Tones to be assigned to the Rhythm Part, and settings such as pan and level can be made for each such Rhythm Tone.
Up to 85 Rhythm Tones can be assigned to Note Numbers, therefore, a great variety of Rhythm Tones can be played by using Note Numbers.

● Controlling the Keyboard and Bender, etc.

The keyboard can be considered as an independent MIDI controller. The keyboard has a transmit channel on which it sends performance data and Control Change messages such as Bender.
If the receive channel of any Part is set to the same number as the keyboard's transmit channel, the keyboard's performance data will be sent to that Part and play it. The keyboard's performance data is also output from MIDI OUT.
When Local Off is selected, the keyboard is disconnected from the internal synthesizer modules. Therefore, the keyboard cannot play the internal modules, but can play an external sound module connected to MIDI OUT.

● MIDI IN

Performance data fed into the D-5 through the MIDI IN will play the relevant Part. If using a device that can simultaneously transmit more than one MIDI channel message, such as a sequencer, several Parts can be played at the same time.

● MIDI OUT

The Keyboard's performance data is output on the set transmit channel through MIDI OUT. If a MIDI sound module is connected to the MIDI OUT, it can be played from the keyboard.

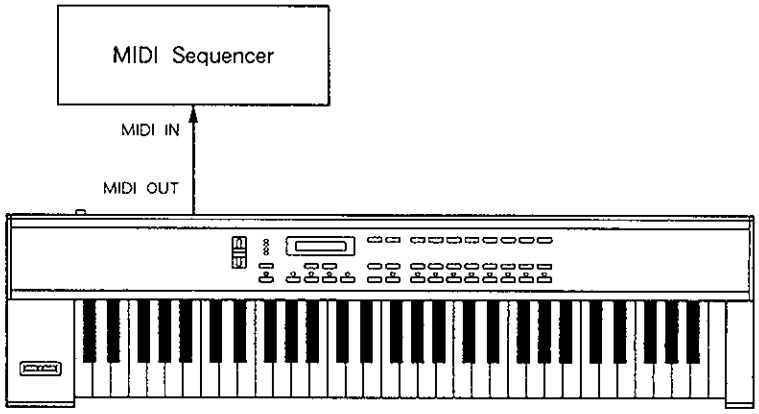
2. Example Setups in the Multi Timbral Mode

The following are some examples for experimenting with the Multi Timbral function.

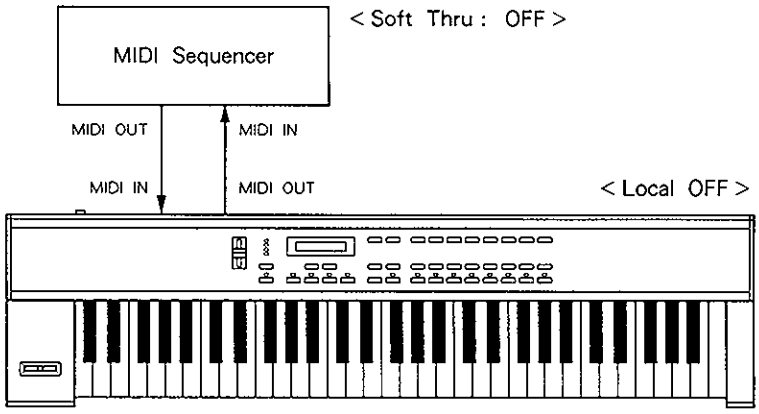
a. Setup with a MIDI sequencer

● Recording into a MIDI sequencer

To record a performance on the D-5's keyboard into a MIDI sequencer, set up the units as follows. Set the transmit channel of the keyboard to the same number as the receive channel of the Part you wish to record, then play the keyboard. To continue, and record another Part, repeat the same procedure.

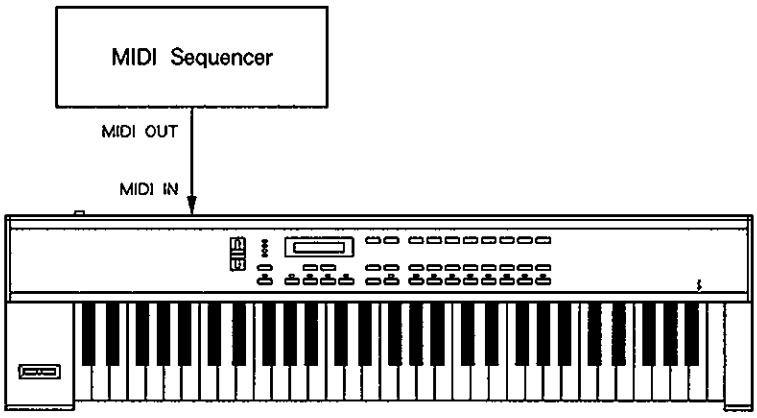


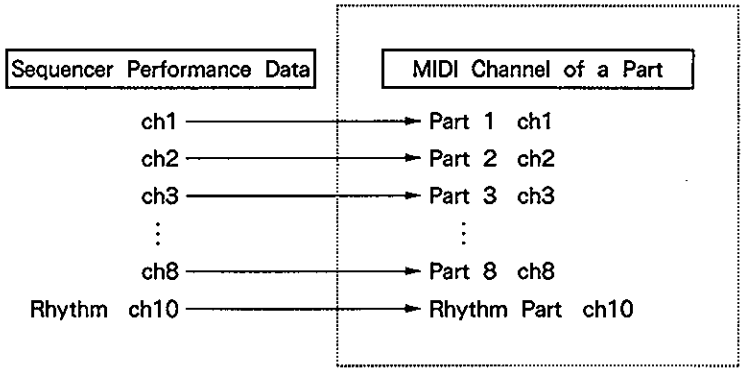
To connect the MIDI IN on one unit to the MIDI OUT on the other unit, set the Soft Thru on the MIDI sequencer to OFF, or set the D-5 to Local Off.



● Playing the D-5 using only a MIDI sequencer

Record performance data of the MIDI channel that is assigned to each Part you wish to play into the sequencer. Set up the sequencer as shown below. Then start playing the sequencer, and each Part is played by the performance data of the relevant MIDI channel.

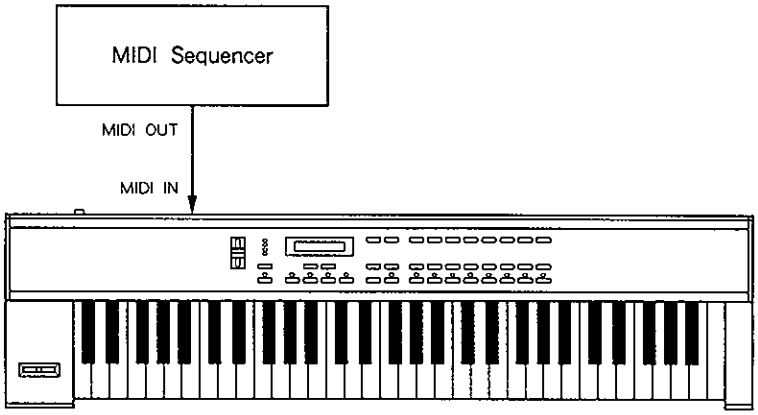


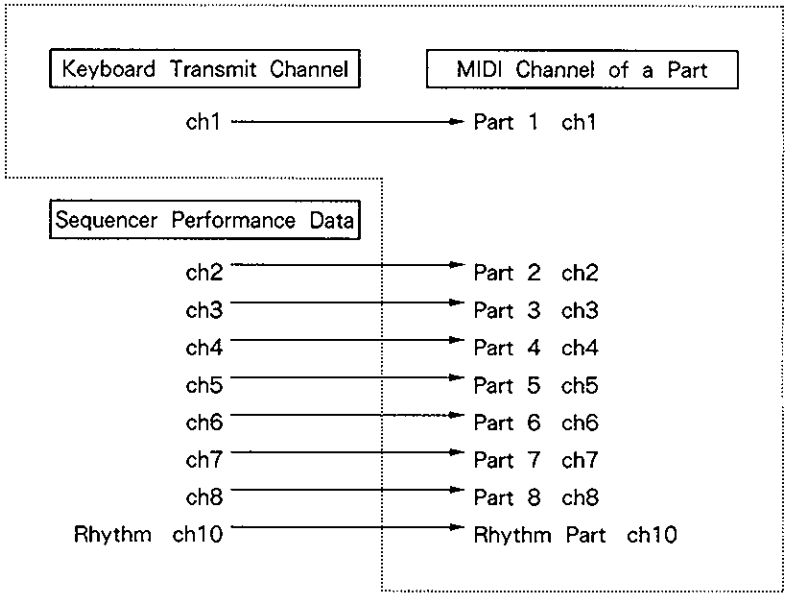


To play the Rhythm Part with the sequencer, you must set the Note number assignment to Rhythm Tones. If you have recorded the D-5's rhythm data into the sequencer, you do not need to rearrange the assignment. However, if you have used another rhythm unit, the rhythm assignment may differ from the D-5's, therefore, the recorded performance data may not play properly on the D-5. To change the rhythm assignment of the D-5, read page 114 "Rhythm Setup".

● Playing the keyboard along with performance on a MIDI sequencer

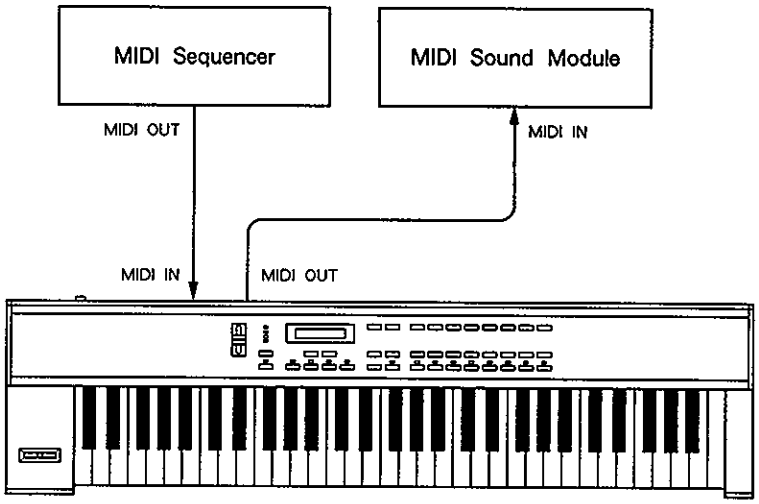
Set the receive channels of all the Parts other than the one to be played by the sequencer to the same number as the keyboard's transmit channel. In this way, the Parts played by the keyboard will sound without being affected by the Parts used for the MIDI sequencer.





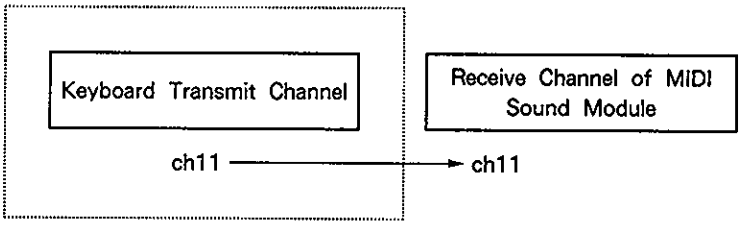
b. Setup with a MIDI sequencer and MIDI sound module

To play the D-5' synthesizer modules with a MIDI sequencer and play an external sound module with the D-5's keyboard, set up the units as follows.



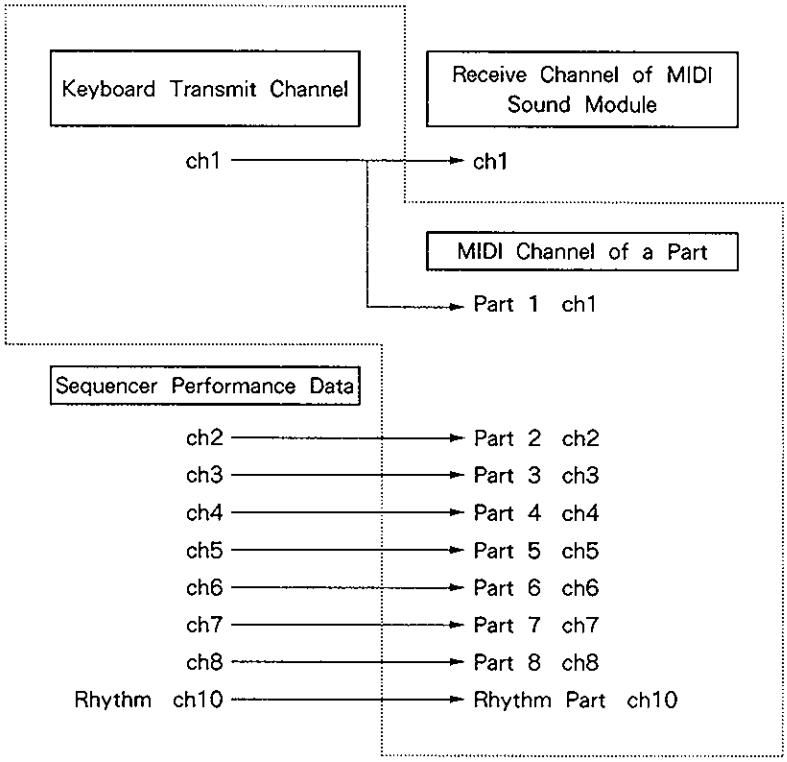
● Playing only the external sound module with the keyboard

To play only an external sound module with the keyboard, set the transmit channel of the keyboard to any number other than those of MIDI channels assigned to the Parts, then set the receive channel of the external sound module to the same number as the transmit channel of the keyboard. If the D-5 is set to Local Off, you do not need to set the transmit channel of the keyboard to a number other than the MIDI receive channels of the Parts.



● Playing a Part and an external sound module in unison with the keyboard

To play a Part and an external sound module in unison with the keyboard, match the keyboard's transmit channel to the receive channel of a Part not used by the sequencer, then similarly match to the receive channel of the external sound module.



3. Preliminary Settings

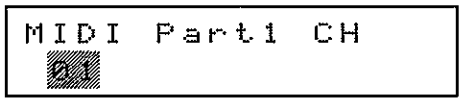
The following explains preliminary settings needed before actually using the Multi Timbral mode. For setting MIDI Functions and Tune/Function parameters, read the separate volume EDIT.

a. MIDI settings

This section explains the basic MIDI settings necessary for using MIDI devices. For setting the other MIDI functions, read page 16 in the separate volume EDIT.

● Receive Channel of each Part (1—16)

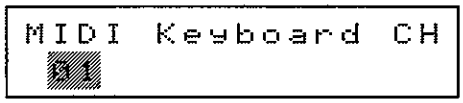
Set the receive channel of each Part. Normally, set a different channel for each Part.



* If the channel of the Rhythm Part is changed, the rhythm channel (page 80) in the Performance mode is also changed.

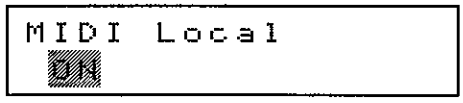
● Keyboard's Transmit Channel (1—16)

Set the transmit channel of the keyboard to the same number as the receive channel of the Part (or the external MIDI sound module) which you wish to play with the keyboard.



● Local Control (ON/OFF)

To play only an external sound module with the keyboard regardless of the receive channels of the Parts on the D-5, set the Local Control to OFF. To mutually connect MIDI IN with MIDI OUT on both the D-5 and a sequencer, set the D-5 to Local OFF, or set the Soft Thru on the sequencer to OFF.



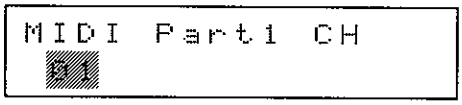
* The Local Control is default to ON whenever powered up.

* If the Local Control is changed here, the Local Control in the Performance mode (page 80) is also changed.

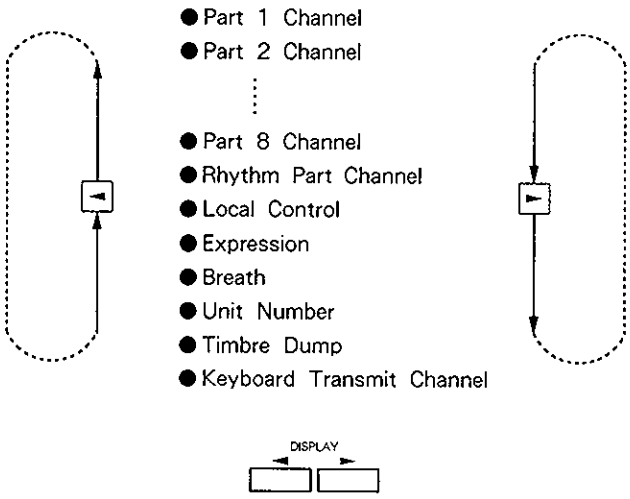
[PROCEDURE]

Before following the procedure, make sure that the D-5 is set to the Multi Timbral mode (the indicator of the **MULTI TIMBRAL** is lit).

1 **Press [MIDI] to turn to the MIDI setting mode.**
Pressing [MIDI] will set it to the Part 1's receive channel setting display.



2 **To call the display of a different MIDI function, press [◄]DISPLAY[►].**



3 **Change values by using [◄]VALUE[►].**

4 **To continue, and edit other MIDI functions, repeat steps 2 and 3.**

5 **When finished, press [EXIT] to return to the previous display.**

b. Other settings

This section explains how to set Pan/Level/Partial Reserve for each Part. These settings are changed as necessary. Additional functions are explained on page 12 in the separate volume EDIT.

* In the Rhythm Part, the value of Pan can be set individually for each rhythm sound, but cannot be set for the entire Rhythm Part. The overall level of the Rhythm Part can be set here. To set the level or pan separately for each rhythm sound, follow the explanation on page 114 "Rhythm Setup".

● Setting Pan and Level By setting the pan and level of each Part (1—8), the output balance of each Part can be controlled.
Pan (panpot) determines the positioning of he sound image in the stereo output. It can be set from 7> to <7 in 15 different levels. At >7, the sound image is set to the left position, at ><, to the center and at <7, to the right. Level can be set from 0 to 100, higher values increasing the level.

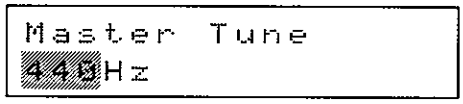
* When a certain Structure is selected, the relation of the Pan values and the actual sound images created differs.(Page 123)

* When the Tone is made of only one Partial, Pan actually changes at 8 levels.

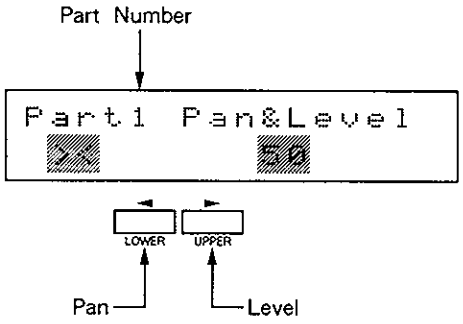
[PROCEDURE]

Before following the procedure, make sure that the D-5 is set to the Multi Timbral mode (the indicator of the **MULTI TIMBRAL** is lit).

1 **Press [TUNE/FUNCTION].**
Pressing [TUNE/FUNCTION] will call the Master Tuning display.



2 **Press [◄]DISPLAY[►] to change to the Part display of Pan/Level.**



3 **Change values by using [◄]VALUE[►].**
To edit the Level value, press [UPPER/►] and to edit the Pan value, press [◄/LOWER]. The value of the blinking parameter can be edited.

4 **To continue, and edit the other Parts, repeat steps 2 and 3.**

5 **When finished, press [EXIT] to return to the previous display.**

● Setting Partial Reserve

The maximum number of voices that can be simultaneously played on the D-5 is 32. When the D-5 receives an excess of Key On messages, certain currently playing sounds may be cut when needed most. To resolve this, you can use the Partial Reserve function that allows you to secure a certain number of Partials reserved for each Part, without the total number of Partials exceeding 32.

The D-5 is 32 voice polyphonic, but it actually produces 32 voices using 32 Partials. A Partial is the smallest unit of a sound within the D-5. The actual number of voices varies depending how many Partials are used for a Tone. For instance, a Tone made of only one Partial can be played using 32 voices, but a Tone using four Partials requires four Partials and therefore can play 8 voices at the same time. If you use nine of such Tones, there will be Parts which cannot use any Partial. Also, a Tone with a long decay may be overlapped with the next Tone, increasing the number of voices.

You can avoid such inconvenience by selecting a Tone made of a small number of voices, or change the arrangement of the song. However, Partial Reserve may be useful when the voice overflow is expected to be minimal.

The Partial Reserve allows you to set the number of Partials used for each Part.

For example :

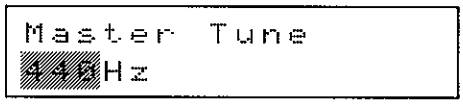
- You could secure four Partials for a Bass to avoid loosing the release, though it is played in single notes.
- You could secure only two Partials for a Sax, as it is played in single notes and does not need release.
- You could secure eight Partials for a Piano, as you may want at least four note chords.

[PROCEDURE]

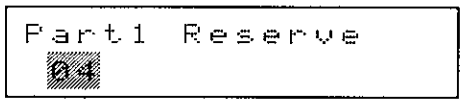
Before following the procedure, make sure that the D-5 is set to the Multi Timbral mode (the indicator of the **MULTI TIMBRAL** is lit).

* The Partial Reserve can be set from 0 to 32 without the total number of Partials in 9 Parts exceeding 32. If you cannot increase the value, check the values set in the other Parts, then try setting again.

1 **Press [TUNE/FUNCTION].**
Pressing **[TUNE/FUNCTION]** will call the Master Tuning display.



2 **Press [◄]DISPLAY[►] to change to the Part display for Partial Reserve.**



3 **Change values by using [◄]VALUE[►].**

4 **To continue, and set the Partial Reserve for other Parts, repeat steps 2 and 3.**

5 **When finished, press [EXIT] to return to the previous display.**

4. Timbre Selection

Timbres can be changed by using the panel buttons on the D-5 or by sending Program Change from an external device.

a. Timbre selection by panel operation

Timbres can be changed by using the panel buttons on the D-5.

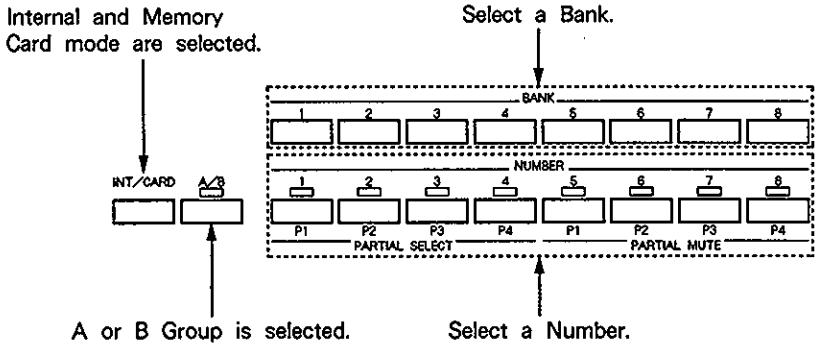
● Changing Timbres using the Keyboard Display

When you wish to send Program Change messages to an external device, such as to record the D-5's keyboard performance into a MIDI sequencer or to play an external sound module with the D-5, change Timbres in the keyboard display.

1 **Change to the keyboard display by pressing ◄/ LOWER or UPPER/►.**

2 **Using the following buttons, change Timbres.**

To change Timbres, you must specify the **NUMBER** last. If you specify only the **NUMBER**, the corresponding Timbre in the same Bank will be selected.



Timbre Numbers correspond to Program Change Numbers as follows.

	Bank \ Number	1	2	3	4	5	6	7	8
A Group	1	1	2	3	4	5	6	7	8
	2	9	10	11	12	13	14	15	16
	3	17	18	19	20	21	22	23	24
	4	25	26	27	28	29	30	31	32
	5	33	34	35	36	37	38	39	40
	6	41	42	43	44	45	46	47	48
	7	49	50	51	52	53	54	55	56
	8	57	58	59	60	61	62	63	64
B Group	1	65	66	67	68	69	70	71	72
	2	73	74	75	76	77	78	79	80
	3	81	82	83	84	85	86	87	88
	4	89	90	91	92	93	94	95	96
	5	97	98	99	100	101	102	103	104
	6	105	106	107	108	109	110	111	112
	7	113	114	115	116	117	118	119	120
	8	121	122	123	124	125	126	127	128

* The same Program Change Numbers are used commonly for the Internal and Card memories.

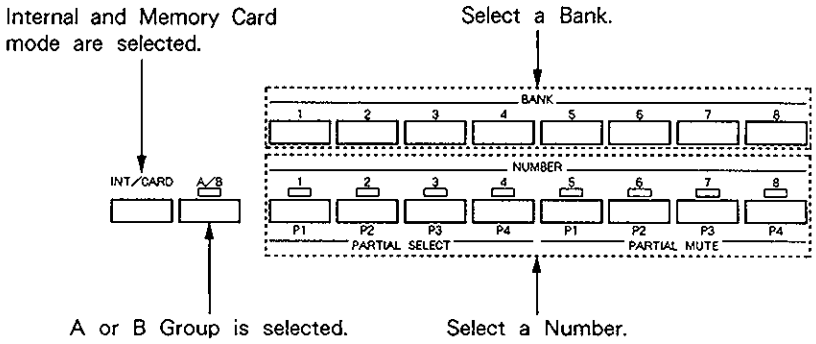
● Changing Timbres using the Part display

When you plan on recording sound data into a sequencer later, you may wish to compare Timbres, or change the Timbres of a Part temporarily. If so, change Timbres in the Part display.

1 **Call the display of the Part whose Timbres you wish to change by pressing ◄DISPLAY►.**

2 **Using the following buttons, change Timbres.**

To change Timbres, you must specify the **NUMBER** last. If you specify only the **NUMBER**, the corresponding Timbre in the same Bank will be selected.



b. Timbre selection from an external MIDI device

Timbres on the D-5 can be changed by Program Change messages sent from an external MIDI device.

If you wish to change Timbres on the D-5 from an external MIDI sequencer or MIDI sound module, send Program Change messages to the D-5.
If Program Change messages have been recorded in a sequencer together with performance data, they will change Timbres in each Part while playing. If you have recorded Program Change messages for the Part to be played by the keyboard, its corresponding Timbres also will be changed.
Program Change numbers correspond to the Timbres differently depending on the MIDI device used. Make confirmation first.

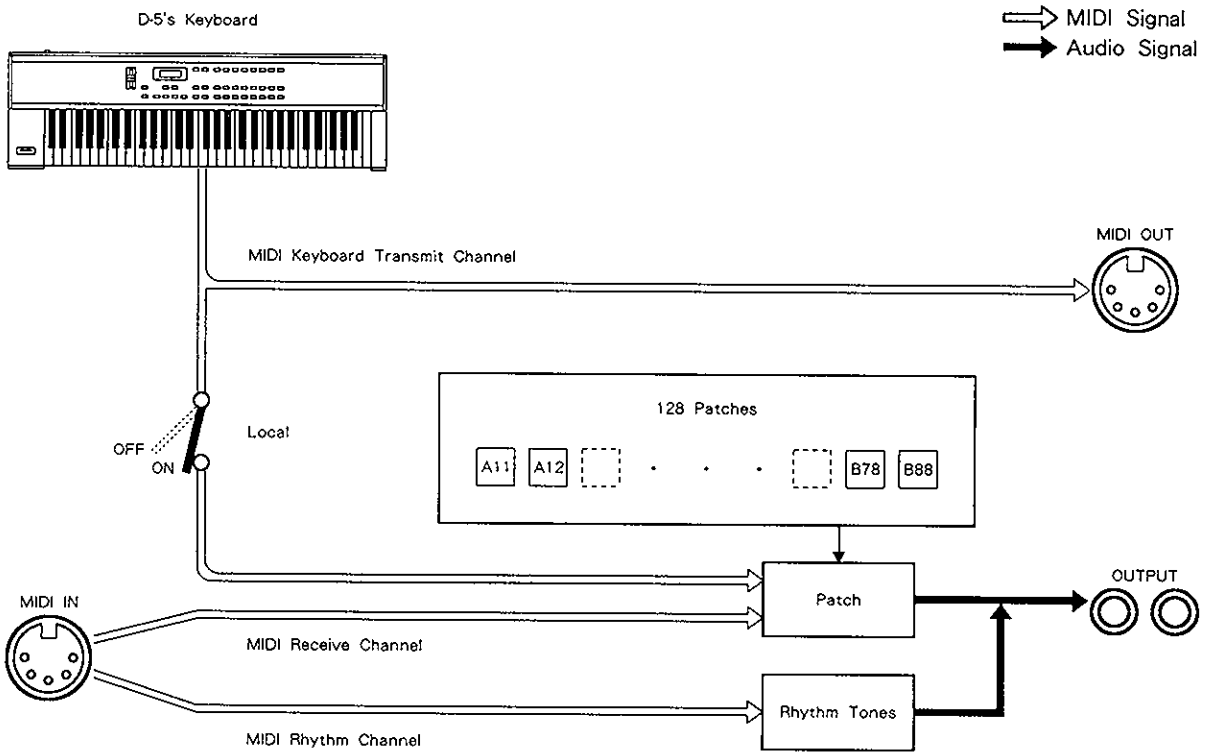
* The same Program Change numbers are used for both Internal and Card memories, therefore, the Internal and Card memory modes cannot be switched by using Program Change messages sent from an external device.

3 EFFECTIVE USE OF THE PERFORMANCE MODE

This section explains how to use MIDI devices in the Performance Mode. It will help you understand what you can achieve using your MIDI devices.

1. Flow of MIDI Messages

In the Performance Mode, the D-5 is divided into three sections, synthesizer modules, a rhythm module and a keyboard controller. These blocks may be considered to be connected via MIDI.



○The D-5's keyboard performance or Control messages such as Bender will not only control the internal synthesizer modules but also an external MIDI sound module connected to MIDI OUT, since these messages are output through MIDI OUT.
In the Performance mode, as opposed to the Multi Timbral Mode, the internal sound modules are connected to the keyboard, and therefore will be always played by the keyboard no matter what MIDI channels, receive and transmit,they are set to. However, if you wish to play only an external sound module with the D-5, you can turn the Local Control to OFF to disconnect the internal sound modules.

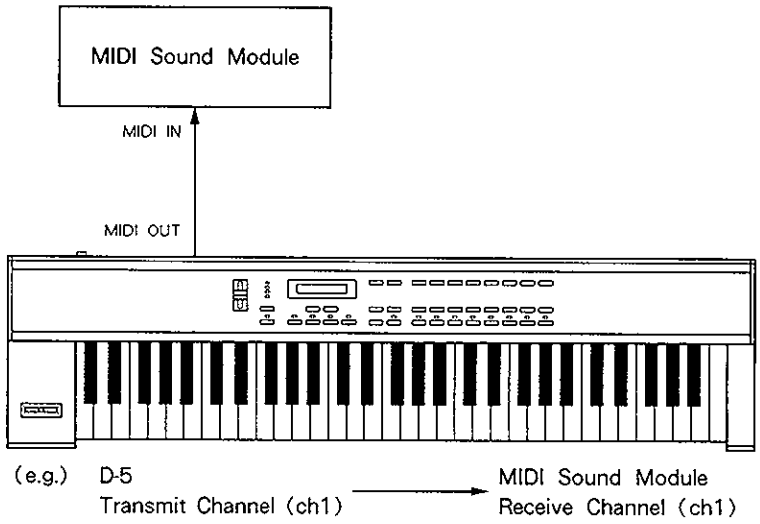
○Performance data fed in through MIDI IN will play the internal sound modules. Performance data received on a MIDI receive channel will control the synthesizer module, and performance data received on the MIDI rhythm channel will control the rhythm module.

2. Example Setups in the Performance Mode

The following are some examples illustrating usages in the Performance mode.

a. Setup with a MIDI sound module

The D-5 and a MIDI sound module can be played in unison with the D-5's internal keyboard.

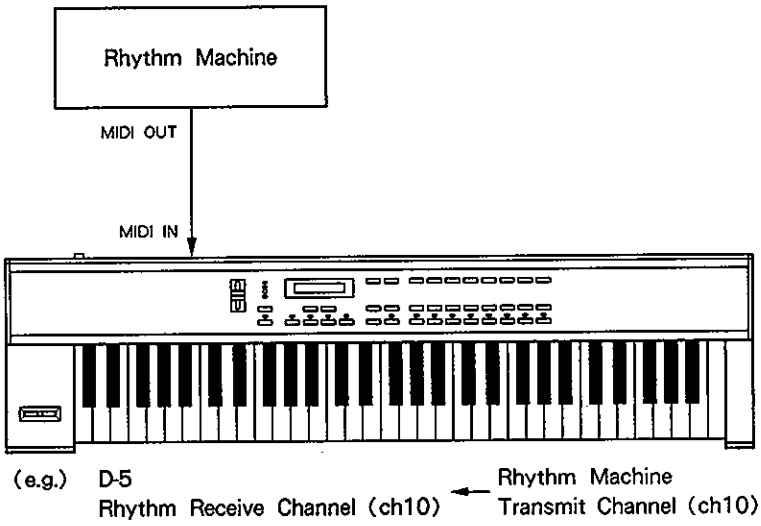


b. Using the D-5 as a MIDI sound module

The D-5's internal sound module can be played by performance data from an external MIDI device.

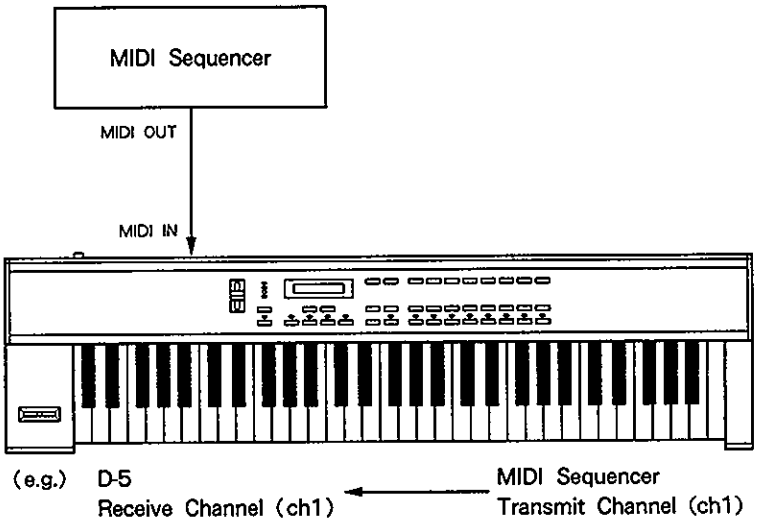
● Setup with a rhythm machine

The rhythm module of the D-5 can be played by performance data programmed on an external rhythm unit.



● Setup with a MIDI sequencer

The synthesizer module of the D-5 can be played by sequencer.



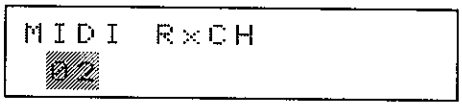
3. MIDI Settings

This section explains the basic MIDI settings necessary for using the D-5 in the Performance mode. For setting other MIDI functions, read page 16 "MIDI Functions" in the separate volume EDIT.

* The MIDI function you have edited will be retained even after the unit is switched off, except for a few cases.

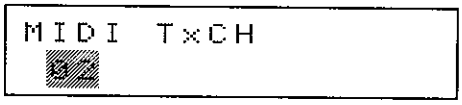
● Receive Channel (1— 16)

Set the receive channel for controlling the D-5 synthesizer module from an external MIDI device.



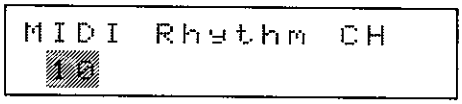
● Transmit Channel (1— 16)

Set the transmit channel for sending keyboard performance data to an external device.



● Rhythm Channel (1— 16)

Set the receive channel for controlling the rhythm module of the D-5 from an external device.

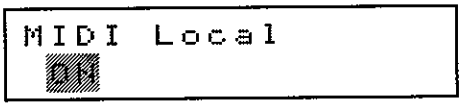


* Changing the rhythm channel here will also change the channel (page 67) of the Rhythm Part in the Multi Timbral mode.

● Local Control (ON/OFF)

This selects whether or not to disconnect the keyboard or performance controlling section on the panel from the synthesizer section.

When this is set to Off, performance data from the keyboard will be output through MIDI OUT, but the synthesizer modules will not be played by the keyboard. However, the synthesizer can be controlled with performance data sent through the MIDI IN.



* The Local Control is default to ON when powered up.
* If the Local Control is edited here, the Local Control in the Multi Timbral mode (page 67) is also changed.

● Program Change (ON/OFF)

To send or receive Program Change messages, set this to ON.

Patch Numbers correspond to Program Change Numbers as follows.

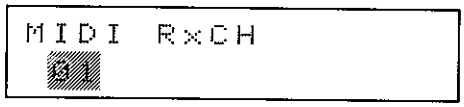
	Bank \ Number	1	2	3	4	5	6	7	8
A Group	1	1	2	3	4	5	6	7	8
	2	9	10	11	12	13	14	15	16
	3	17	18	19	20	21	22	23	24
	4	25	26	27	28	29	30	31	32
	5	33	34	35	36	37	38	39	40
	6	41	42	43	44	45	46	47	48
	7	49	50	51	52	53	54	55	56
	8	57	58	59	60	61	62	63	64
B Group	1	65	66	67	68	69	70	71	72
	2	73	74	75	76	77	78	79	80
	3	81	82	83	84	85	86	87	88
	4	89	90	91	92	93	94	95	96
	5	97	98	99	100	101	102	103	104
	6	105	106	107	108	109	110	111	112
	7	113	114	115	116	117	118	119	120
	8	121	122	123	124	125	126	127	128

* The same Program Change numbers are used for both Internal and Card memories, therefore, the Internal and Card memory modes cannot be switched by using Program Change messages sent from an external device.

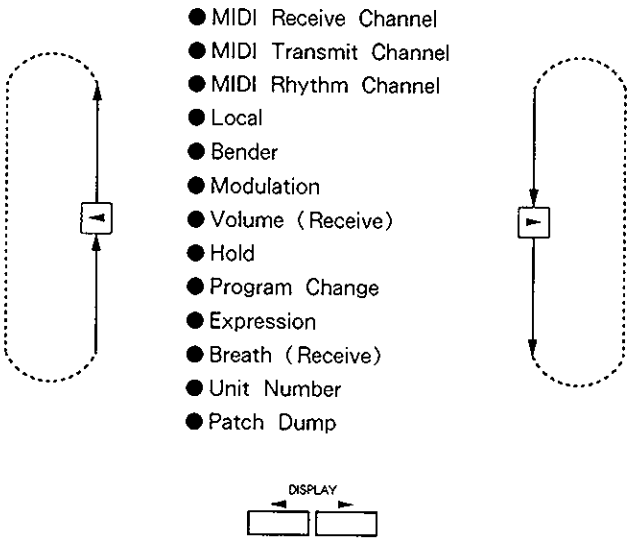
[PROCEDURE]

Before following the procedure, make sure that D-5 is set to the Performance mode (the indicator of the **PERFORMANCE** is lit).

1 **Press [MIDI] to turn to the MIDI setting mode.**
Pressing [MIDI] will set to the receive channel setting display.



2 **To call the display of the MIDI function you wish to edit, press [◄]DISPLAY[►].**



3 **Change values by using [◄]VALUE[►].**

4 **To continue, and edit the other MIDI functions, repeat steps [2] and [3].**

5 **When finished, press [EXIT] to return to the previous display.**

SECTION Ⅲ

SOUND EDITING (BASIC EDITING)

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What is Editing?

A synthesizer features two major functions; one is playing, the other is synthesizing. Sound synthesis on a synthesizer involves various parameters. Modifying the values of parameters is Editing. Changing MIDI channels, pan and level settings is also editing.

To begin editing, you could select a Patch or Timbre which is already close to the image you seek, then edit a part of it. For instance, shifting the pitch of the sound just one octave above or below will considerably change the nuance of the sound. Many different Patches or Timbres can be created simply by using the Tones preprogrammed on the D-5.
When you wish to go further, you can create new Tones. There are many numbers of parameters comprising a Tone, so Tone editing is not an easy job. You should carefully study the parameters of existing Tones and understand the make-up of sound first.
You can edit as much as you like, without fear of losing previous sound data unless you perform the write procedure. So, you can experiment as many times as you like, and still return to the original sound.

1 EDITING IN THE PERFORMANCE MODE

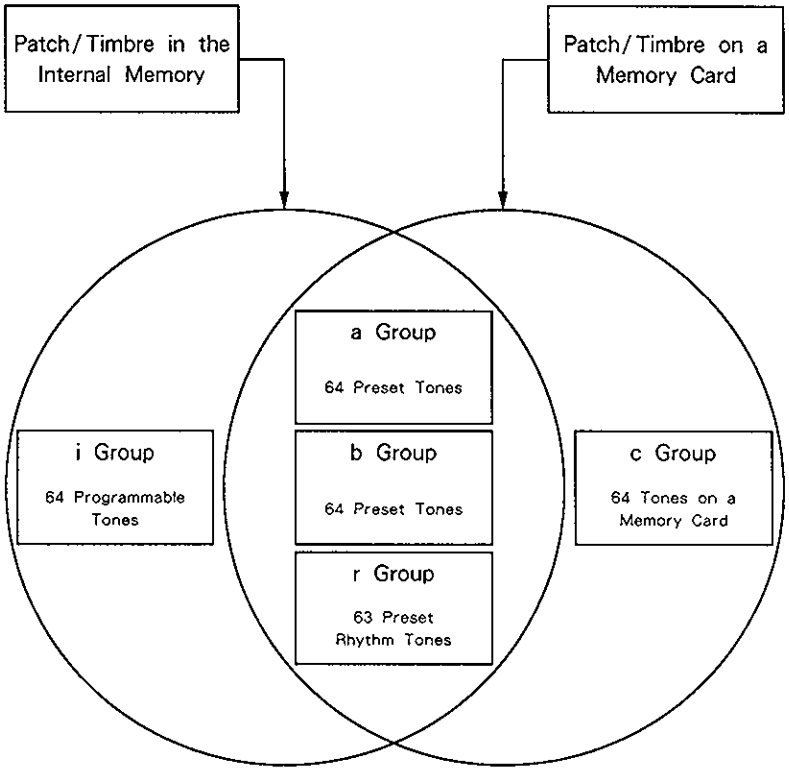
In the Performance mode, Patches and Tones can be edited. This section explains Patch editing. Select a Patch that is close to your image, and edit a part of the data. For Tone editing, see page 119 "Tone Setting".

1. Relation Between Patch and Tone

A Tone is the basic unit of a sound. A Patch consists of a pair of Tones combined with various Patch parameters that determine how the Tones are to be played.

The Tones (Tone Numbers) assigned to each Patch are merely numbers, in other words, they do not include the Tone data contents. So, even when two different Patches use the same Tones, they will sound completely different if the Patch parameters are set differently. However, if the same Tone is used in more than one Patch, editing data for the Tone will affect all the Patches that use this Tone.

Tones are arranged in different Tone groups, a, b, r, i and c. Tones in a, b and r groups can be used for Patches both in the internal memory and on a memory card, but Tones in i group can be assigned only to Patches in the internal memory. Tones in the c group can be used only in the Patches on a memory card.



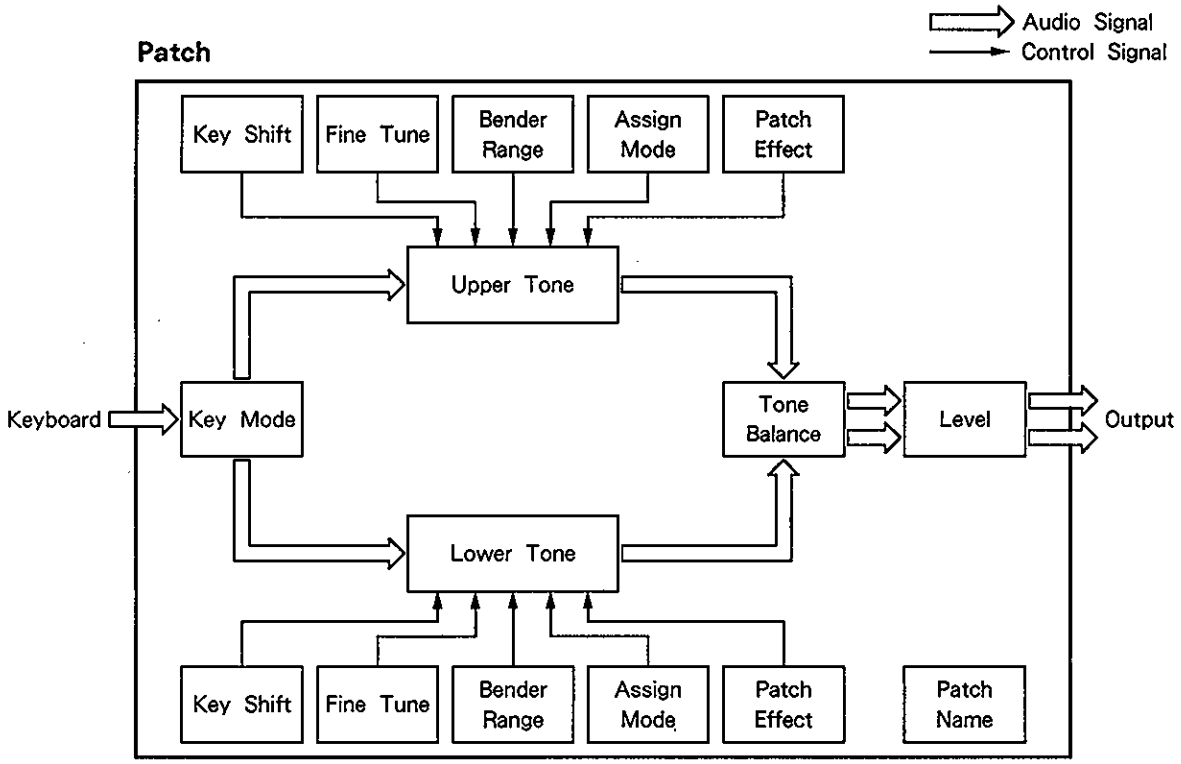
If you write a Patch in the internal memory onto a memory card, Tones in group i will be automatically replaced by Tones of group c. Consequently, the Patch will be changed.

To avoid this, write the relevant Tones in the internal memory onto a memory card first. The same thing applies when copying a Patch from a memory card to the internal memory.

2. Setting Patches

A Patch is accompanied with Patch parameters such as Tone assignment, Key Mode, etc.

The following outlines the structure of Patch parameters.



a. Functions of patch parameters

Patch parameters may be divided into five groups :

- **Performance Controlling parameters**
- **Tone Selection parameters**
- **Pitch parameters**
- **Volume parameters**
- **Other parameters**

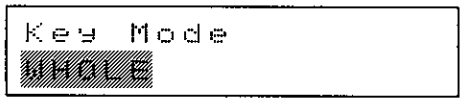
■ A Performance Controlling parameters

● Patch Effect Select (OFF, Chord Play, Harmony, Chase, Arpeggio)

This allows you to select which Patch Effect (Chord Play, Harmony, Chase or Arpeggio) should be turned on in each Patch. To select a Patch Effect to be used, use the relevant Effect button.

For detailed explanation of how each effect is used, see page 35 "Patch Effects".

● Key Mode (WHOLE, DUAL, SPLIT)



Two Tones, Upper and Lower Tones can be assigned to a Patch. Key Mode determines how these Tones should be output.

WHOLE :

Only the Upper Tone is played on the entire keyboard. This mode may be ideal for a piano type tone that requires many numbers of voices.

DUAL :

Both Upper and Lower Tones are played on the entire keyboard. This mode allows you to create fat sounds by slightly shifting the pitch of either tone ; or to play two tones in unison. It may also be interesting to mix a quick attack sound and slow attack sound. Ideal for strings or orchestra type tones.

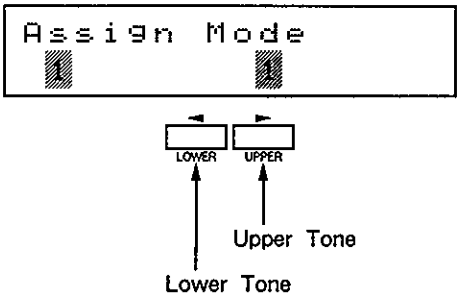
SPLIT :

The keyboard is split into two sections at the Split Point. Upper Tone is played in the upper section of the keyboard and Lower Tone is played in the lower section. This mode, therefore, allows you to play the piano part with you right hand while playing the bass part with your left hand.

● **Split Point (C2—C # 7)**

This sets the key position where the keyboard is split into the upper and lower sections. It is also used to divide the keyboard for the Chord Play, Harmony or Arpeggio. When the Chord Play or Harmony function is being used, even if the Key Mode is set to other than the Split mode, the keyboard will be divided at the set Split Point.

● **Assign Mode (1—4)**



Assign Mode refers to how each Tone should be played by Key messages.

1 : Single Assign – Played with Last Note Priority
2 : Single Assign – Played with First Note Priority
3 : Multi Assign – Played with Last Note Priority
4 : Multi Assign – Played with First Note Priority

Single Assign :

When more than one Key On message is received by the same Key Number, the sound of that key is muted once, then played again.

Multi Assign :

When more than one Key ON message is received by the same Key Number on the same MIDI channel, the two sounds are mixed.

Last Note Priority :

When the D-5 has received more Key On message than the maximum voices, the earlier messages are replaced by the later ones.

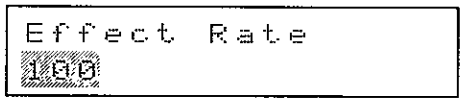
First Note Priority :

When the D-5 receives more Key On message than the maximum voices, the later messages are ignored, retaining the currently playing sounds.

Set the Assign Mode depending on the type of Tone or Partial :

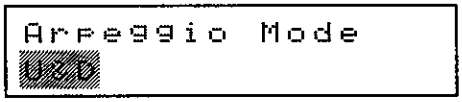
Tone with long release :	3 or 4
Tone with short release :	1 or 2
Tone that uses many number or Partials :	1 or 3
Tone that uses a small number of Partials :	2 or 4

● Effect Rate (0—100)



This sets the rate of the Chase or Arpeggio effect. You may set it for matching the tempo to the song to be played.

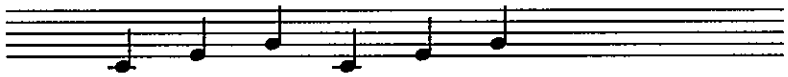
● Arpeggio Mode (UP, DOWN, U & D, RND)



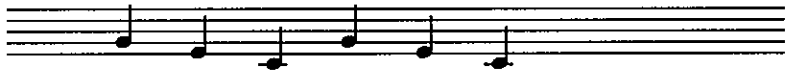
This selects one of the following Arpeggio Performance Patterns.

UP :

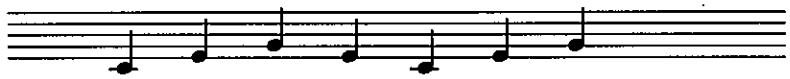
This plays the chord from the root note.

[Example : C chord]

DOWN :

This plays the chord from the highest note.

[Example : C chord]

U & D (Up & Down) :

This plays the chord from the root note to the highest note, then plays downward, in sequence.

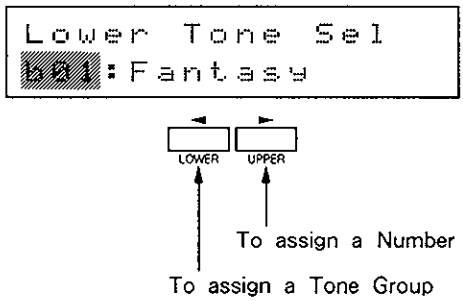
[Example : C chord]

RND (Random) :

This plays the chord in random order.

[Example : C chord]

■ A Tone Selection parameters

● Lower Tone Select (a1—a64, b1—b64, i(c)1—i(c)64, r1—r63, OFF)

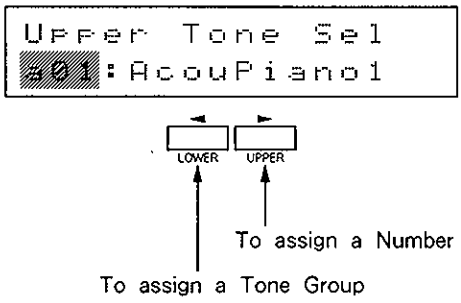


This selects the Tone assigned to the lower section of the keyboard. Tones are arranged in several Tone groups. The a, b, r, and i groups can be used or Internal Patches. The a, b, r, and c group can be used or the Patches on a memory card. At OFF, no sound is generated.

	Internal		Memoty Card	
Tone Group	a, b, i	r	a, b, c	r
Number	1—64	1—63, OFF	1—64	1—63, OFF

a : Preset Tone (Internal)
b : Preset Tone (Internal)
r : Preset Rhythm Tone (Internal)
i : Programmable Tone (Internal)
c : Tone on a memory card

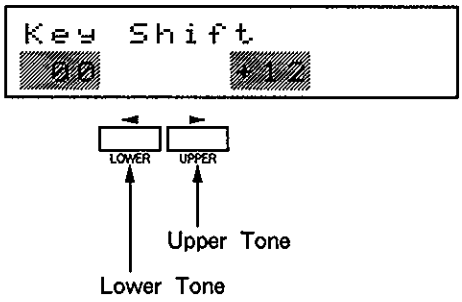
● Upper Tone Select (a1—a64, b1—b64, i(c)1—i(c)64, r1—r63, OFF)



This selects the Tone assigned to the upper section of the keyboard. Tones are arranged in several Tone groups. The a, b, r, and i groups can be used for Internal Patches. The a, b, r, and c group can be used for the Patches on a memory card. At OFF, no sound is generated.

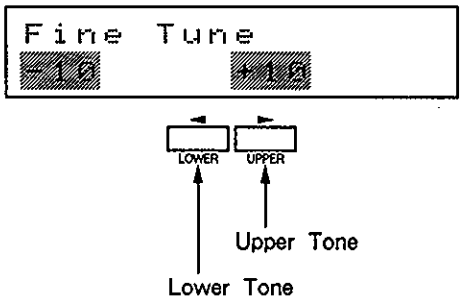
■ Pitch Parameters

● Key Shift (−24—+24 in semitone steps)



The Key Shift function shifts the pitch of each Tone in semitone steps. In the above example, only the Upper Tone is shifted one octave above (12 = 1 octave).
When using the Key Shift function in the Dual Key mode, select the same types of Tones for Upper and Lower, and shift the pitch one octave or a 5th, and a fat sound will be obtained. Strings or brass type Tones may be used to obtain more effective results with Key Shift.
In the Split Key mode, Key Shift may be used for matching the sound range of the Upper and Lower Tones.

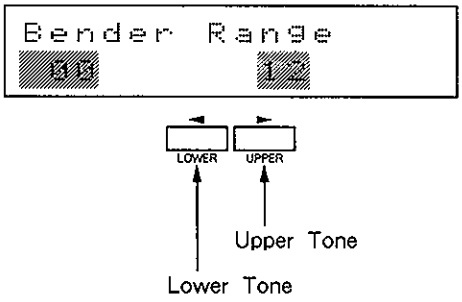
● Fine Tune (−50—+50 : approx. ± 50 cents)



Fine Tune performs subtle pitch adjustment for each Tone. In the Dual Key mode, select the same types of Tones for Upper and Lower and shift the pitch slightly, and a richer sound will be obtained. Strings or brass type Tones can be used to obtain the most effective results with Fine Tune.

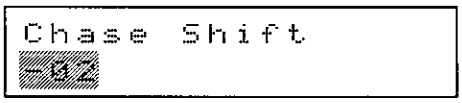
* To tune the overall pitch of the D-5, use the Master Tune function (See page 40).

● **Bender Range (0—24 in semitone steps)**



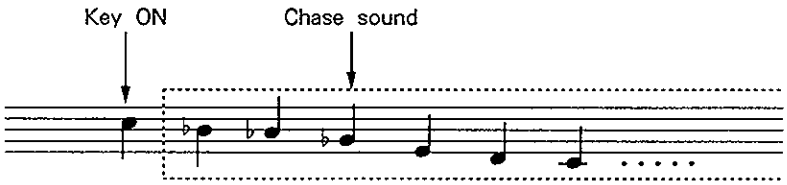
When the pitch is controlled with the Bender Lever, this sets the variable range of the pitch change caused by moving the lever to the right or left extremes.
In the above example, when the Bender Lever is moved to the right (or left) extreme, the pitch of the Lower Tone remains intact, while the pitch of the Upper Tone is increased (or decreased) by one octave. If the value for the Upper Tone is set to 7, harmony of a 5th will be obtained. Higher values will create portamento – like effect.

● **Chase Shift (– 12— + 12 in semitone steps)**

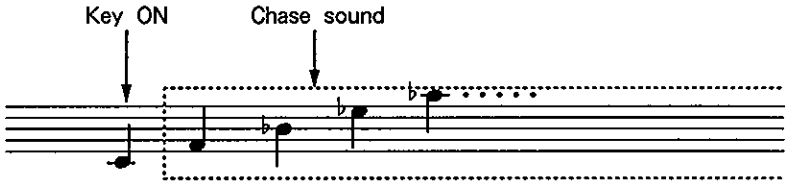


This sets how the pitch of the Chase sound (repeat) changes.
When it is set to "+" values, the pitch increases gradually, and when set to "–", it decreases. At zero, the pitch does not change.

– 2 value



+5 value

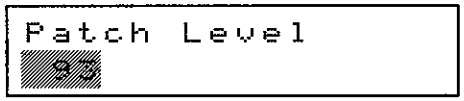


You may set it to chromatic (semitone) to create wind chime sounds, or set to a 3rd or 5th to create chord-like effects.

* Any note exceeding the sound range (C1—C9) cannot be played.

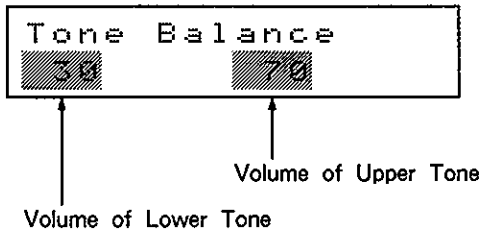
■ Volume Parameters

● Patch Level (0—100)



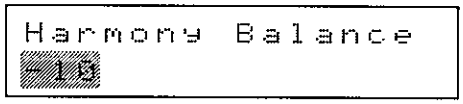
This adjusts the overall volume of a Patch. Using this parameter, you can adjust the volume balance of the Patches, so that the volume will not change erratically when Patches are changed.

● Tone Balance (0—100)



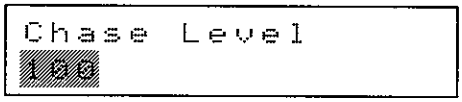
Adjust the volume balance of the Upper and Lower Tones. The total volume of the two Tones is always 100, and increasing the volume of either Tone will automatically decrease the other one.

● Harmony Balance (– 12—0)



This adjusts the volume balance of the harmony and top note (the key pressed on the upper keyboard) when the Harmony effect is being used.

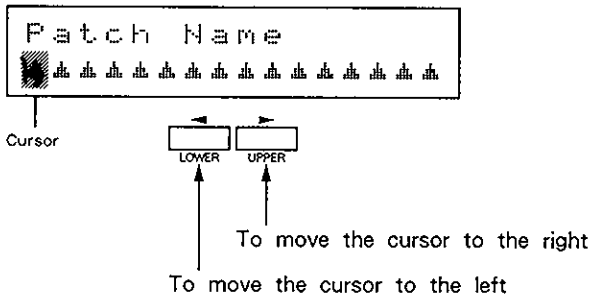
● Chase Level (0—100)



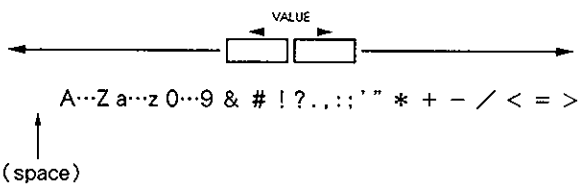
This sets the amount of decay in the Chase sound (repeat sound) when the Chase effect is being used.
Lower values will make the Chase change more drastically, while higher values will make it change more slowly.

■ Other Parameters

● Patch Name



You can put a name to each Patch using up to 16 characters.
Move the cursor to the character to be changed with ◄/LOWER UPPER/►, then change the character with ◄VALUE►. Characters available for Patch Names are as follows :

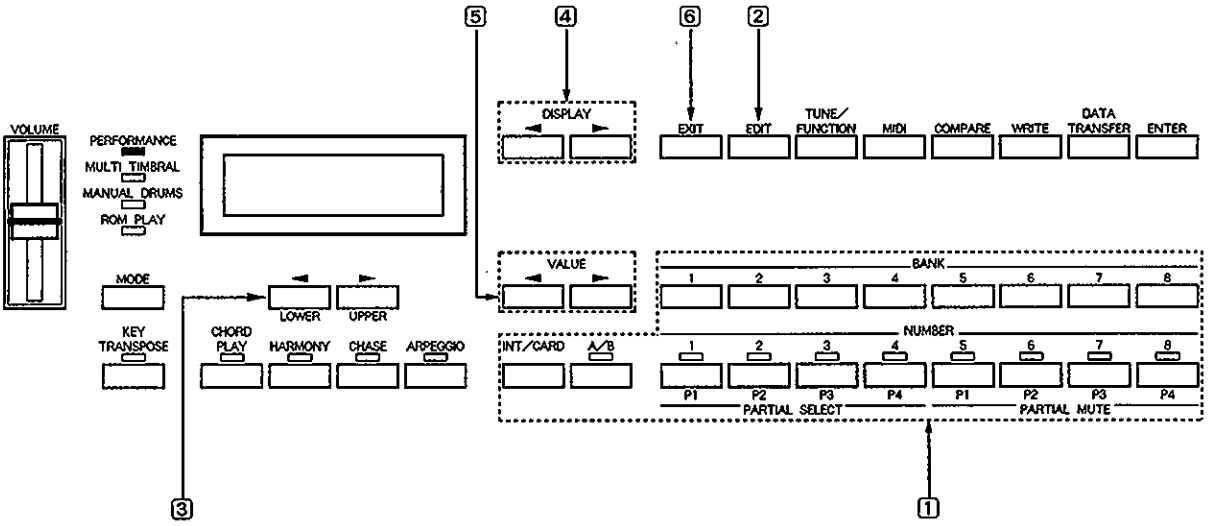


b. Editing procedure

This section explains the basic procedure for editing the Patch parameters described in the previous section.

* Edited data will be erased if you switch off the unit or return the unit to Play mode, then change Patches or operation modes. To retain the edited data, be sure to take an appropriate writing procedure (page 99).

Before going to the editing procedure, check if the unit is set to the Performance mode (the indicator of **PERFORMANCE** is lit).



1 **Select the Patch to be edited.**

2 **Press [EDIT].**

```
Edit Select
Patch    Tone
```

3 **Press [◄/LOWER] to turn to "Patch".**

```
Key Mode
SPLIT
```

4 **Select the parameter to be edited with ◄DISPLAY►.**
Pressing ► will advance the display, while ◄ will move to the previous displays.

●Key Mode
●Split Point
●Lower Tone Select
●Upper Tone Select
○Key Shift
○Fine Tune
○Bender Range
○Assign Mode
●Effect Rate
●Harmony Balance
●Chase Shift
●Chase Level
●Arpeggio Mode
●Tone Balance
●Patch Level
●Patch Name

* A parameter with the ○ mark can be set separately for the Upper and Lower Tones. To edit the Upper Tone, press **UPPER/►**, and to edit the Lower Tone, press **◄/LOWER**. The value of the pressed Tone will blink, showing that it can be edited.

5 **Change the value using ◄VALUE►.**
While the value is being edited, it keeps blinking.

* If you wish to hear the Patch before editing it, press **COMPARE** during editing. Pressing it again will return to the editing mode.

6 **To continue, and set a different parameter, repeat steps 4 and 5.**

* To quit editing, press **EXIT**. The unit will return to Play mode.

7 **To write the edited value into memory, take the following writing procedure.**

c. Writing procedure

If you wish to retain the edited data for later use, write it into the internal memory or onto an optional memory card.
This section explains how to write into the internal memory. To write onto a memory card, read "Writing Data onto a memory card" on page 118 in the EDIT volume.

To write data into the internal memory, specify the destination Patch number where the edited data is to be written. It is wise to select the destination Patch so that you can easily arrange the Patches later. For instance, you could arrange the Patches in the same order as they will be played, or group together the same type of sounds. (By repeating the writing procedure, you can rearrange the order of Patches.)
Writing data to internal memory will automatically rewrite any previous Patch. To retain the existing data, save it on a memory card.

■ Memory Protect

The D-5 features the Memory Protect function that protects data in memory from accidental erasure. Memory Protect is default to ON. To write data into memory, turn the Memory Protect of the D-5 off.
There are two different methods for turning Memory Protect off as follows.

● Temporary Protect Off Temporary Protect Off is used for turning the memory protect function off only during the actual write, then automatically returns Protect to On when finished. This type of Protect OFF will be sufficient if you need to turn off the memory protect just once, such as when writing edited data. How to set the Temporary Protect Off is explained on page 101 "Writing into the Internal Memory".

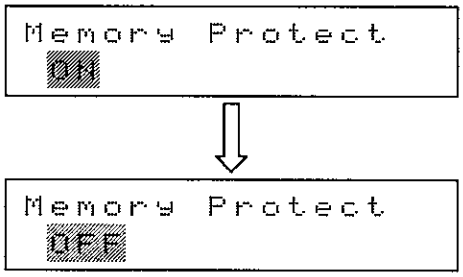
● Normal Protect Off The normal type Protect Off remains off until you change it, and may be more convenient when you need to write repeatedly.

To turn the Normal Protect off, do as follows.

1 **Press [TUNE/FUNCTION].**

2 **Press [◄]DISPLAY[►] to call the Memory Protect display.**

3 **Set the Memory Protect to OFF using [◄]VALUE[►].**



* Every time you finish writing, be sure to return Memory Protect to ON using the same procedure as above.

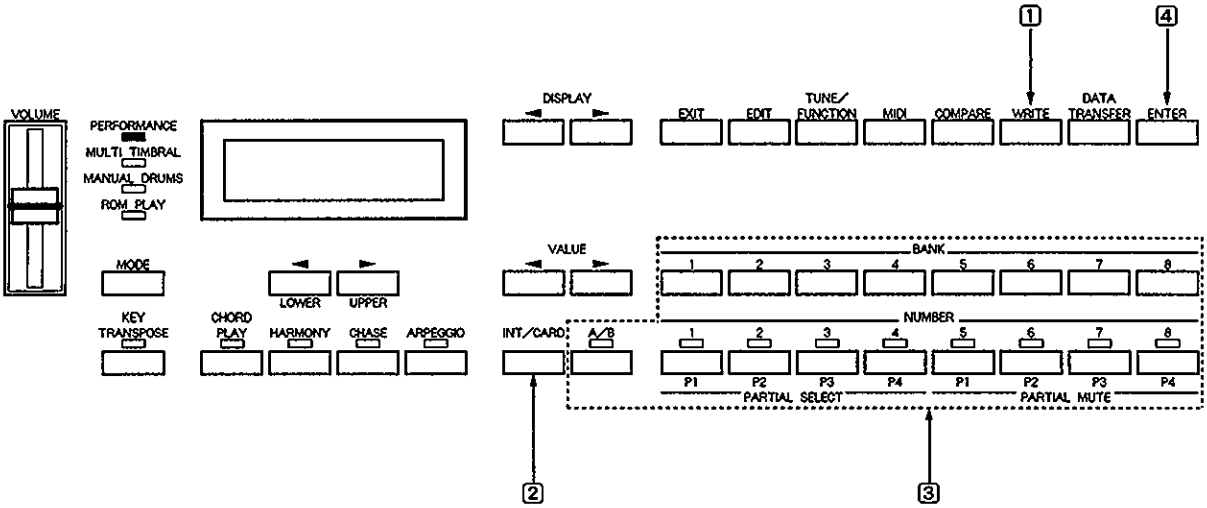
4 **Press [EXIT] to return to the previous display.**

* When the unit is switched off, the Memory Protect status is returned to ON.

■Writing data into the internal memory

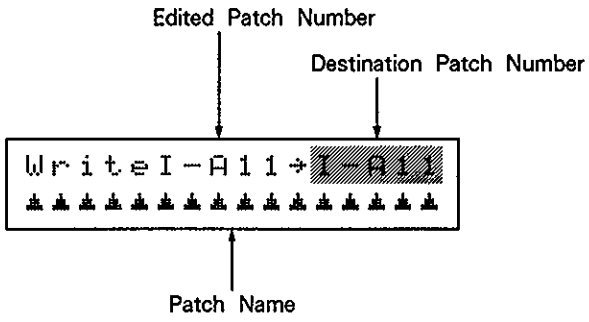
To write a Patch into internal memory after editing is completed :

Enter the Patch writing mode from Patch editing (in any Patch parameter display), or while playing in the Performance mode.



1 **Press [WRITE].**

The Writing display is called.



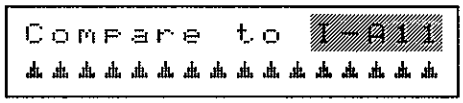
2 **When you have been editing a Patch on a memory card, change from the Card (C) to Internal (I) by pressing [INT/CARD].**

* When writing a Patch on a memory card into the internal memory, even if Tones in c group have been used, they will automatically be replaced by i group Tones. (See page 85 "Relation between Patch and Tone") Therefore, if the contents of the Tones in the internal memory are different from the Tones on the memory card, the Tones will be changed. (See page 140 Tone of writing Procedure)

3 **Specify the destination Patch number where the edited version is to be written, using A/B, BANK 1 to 8, NUMBER 1 to 8.** To write to the same Patch number, skip this.

If you wish to listen to the destination Patch before writing over it, do as follows.

①Press COMPARE.

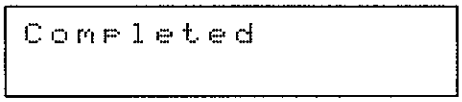


Now, the selected Patch will be heard by playing any key on the keyboard. At this stage, you can also listen to a different Patch by changing Patches.

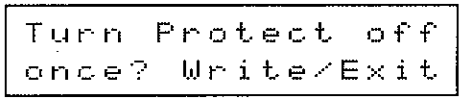
②Press COMPARE to return to the Writing display.

4 **Press ENTER.**

○If the Memory Protect was OFF, the display responds as shown below for a while, then returns to a Play mode display.



○If the Memory Protect has been ON, the display responds as shown below.



If you wish to temporarily turn Protect OFF, press WRITE then ENTER.

* If you press EXIT before the writing is not yet completed, the unit will be returned to the Patch Editing display. At this stage, if you wish to continue writing, press WRITE. Changing Patches without pressing WRITE then will erase the edited data.

* When the write was not successful, an error message will appear. See page 144 "Error Messages" in the EDIT volume to resolve it.

2 EDITING IN THE MULTI TIMBRAL MODE

In the Multi Timbral mode, Timbres and Tones can be edited. This section explains Timbre editing. Select a Timbre that is closest to the conception you have, and edit parts of the data. For Tone editing, see page 119 "Tone setting".

1. Relation Between Timbre and Tone

Both Timbres and Patches are composed of certain Tone numbers, and data determining how they function in performance. One main difference is that while 2 Tones are set for a Patch, only 1 makes up a Timbre. For that reason the parameters for a Patch are somewhat different than those for a Timbre.

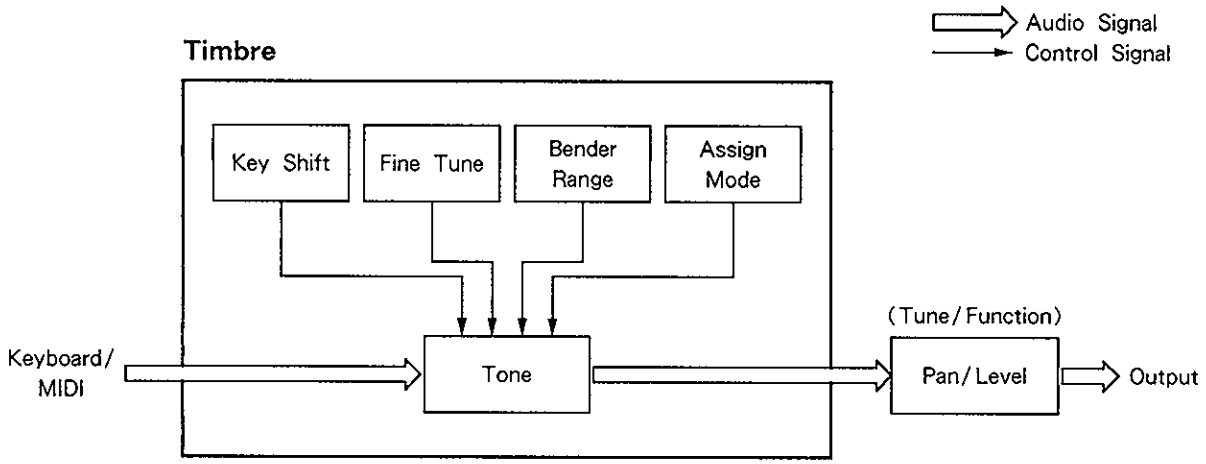
Tones, though, can be used commonly for both Timbres and Patches. Be aware though that if you edit the Tone used in a Timbre, any Patch that uses the same Tone will also sound different. (The reverse is also true.)

Tones are classified by several Tone groups, a, b, r, i, and c. (Refer to page 85 "Relation between Patch and Tones".) Tones in the a, b, and r groups can be used for Timbres both in the internal memory and on a memory card, but Tones in group i can be assigned only to Timbres in the internal memory, and Tones in group c can be used only in the Timbres on a memory card.
If you write a Timbre in the internal memory onto a memory card, and its Tone is of group i, the Tone will be automatically replaced by a Tone of group c. Consequently, the Timbre will be changed. To avoid this, write the relevant Tone in the internal memory onto a memory card first. The same thing is applicable when copying a Timbre from a memory card to the internal memory.

2. Timbre Settings

A Timbre is accompanied by Timbre parameters such as Tone assignment, Key Shift, etc.

Timbre parameters looked at by function :



a. Functions of Timbre parameters

Timbre parameters may be divided into four groups :

- **Performance Controlling parameters**
- **Tone Selection parameters**
- **Pitch parameters**
- **Other parameters**

■ Performance Controlling Parameters

● Assign Mode (1—4)

Assign Mode refers to how each Tone should be played by Key messages.

1 : Single Assign – Played with Last Note Priority
2 : Single Assign – Played with First Note Priority
3 : Multi Assign – Played with Last Note Priority
4 : Multi Assign – Played with First Note Priority

Single Assign :
When more than one Key On message is received by the same Key Number, the sound of that key is muted once, then played again.

Multi Assign :
When more than one Key On message is received by the same Key Number, two sounds are mixed.

Last Note Priority :
When the D-5 has received more Key On messages than the maximum voices, the earlier messages are replaced by the later ones.

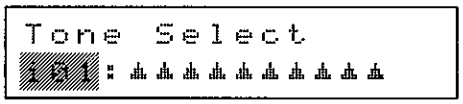
First Note Priority :
When the D-5 has received more Key On messages than the maximum voices, the later messages are ignored, retaining the currently playing sound.

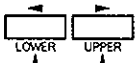
Set the Assign Mode depending on the type of Tone or Partial :

- Tone with long reverberation : 3 or 4
- Tone with short reverberation : 1 or 2
- Tone that uses many numbers of Partials : 1 or 3
- Tone that uses a small number of Partials : 2 or 4

■ A Tone Selection Parameters

● Tone Select (a1—a64, b1—b64, i(c)1—i(c)64, r1—r63, OFF)





Push this to assign a Tone Number

Push this to assign a Tone Group

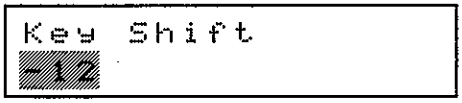
This selects a Tone assigned to the Timbre. Tones are arranged in several Tone groups. The a, b, r, and i groups can be used for Internal Timbres. The a, b, r, and c group can be used for the Timbres on a memory card. At OFF, no sound is generated.

	Internal		Memory Card	
Tone Group	a, b, i	r	a, b, c	r
Number	1—64	1—63, OFF	1—64	1—63, OFF

a : Preset Tone (Internal)
b : Preset Tone (Internal)
r : Preset Rhythm Tone (Internal)
i : Programmable Tone (Internal)
c : Tone on a memory card

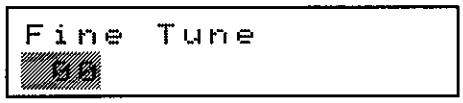
■ Pitch Parameters

● Key Shift (−24—+24)



The Key Shift function shifts the pitch of a Tone in semitone steps. In the above example, Tone is shifted one octave lower (12 = 1 octave).
Key Shift allows you to play a Tone without shifting the key, using the same score, even when the key of an instrument is different. For instance, a score for the trumpet is written in the key of B♭. If you set the Key Shift of the trumpet to −2, you do not need to transpose to play it as written.

● Fine Tune (−50—+50 : Approx. ±50 cents)



Fine Tune performs subtle pitch adjustment for each Tone, and may be effectively used for matching pitch of Timbres used in ensemble performance. Also, by shifting the pitch slightly, rich sounds can be obtained.

● Bender Range (0—24 : semitone steps)

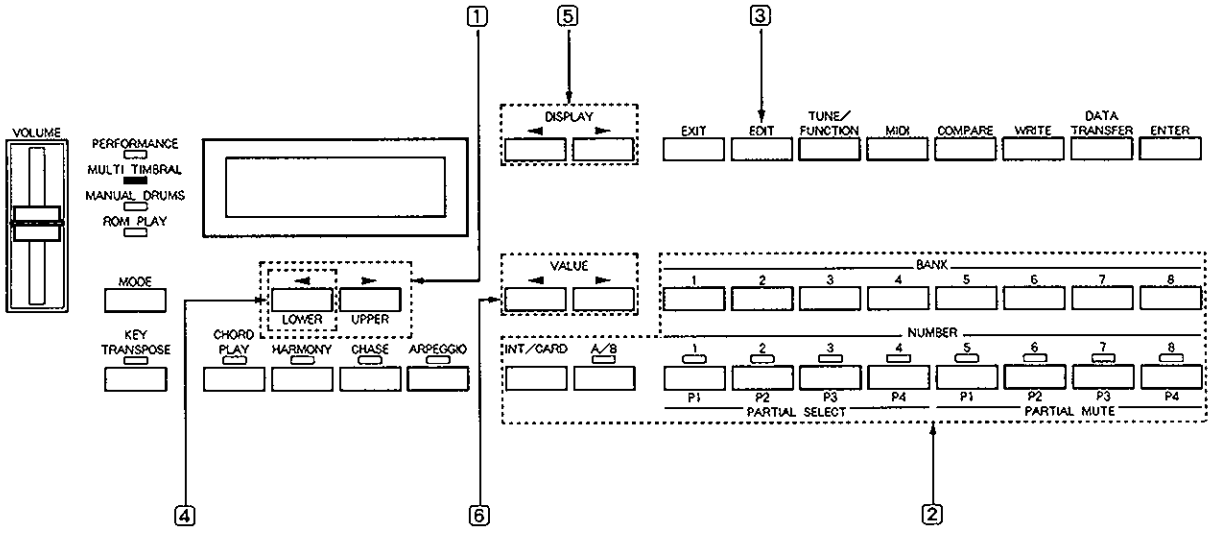
When the pitch is controlled with the Bender Lever, this sets the variable range of the pitch change caused by moving the lever to the right or left extremes.

b. Editing procedure

This section explains the basic procedure for editing the Timbre parameters described in the previous section.

* Edited data will be erased if you switch off the unit or return the unit to Play mode then change Timbres or select a different operation mode. To retain the edited data, be sure to take an appropriate writing procedure (page 110).

Before starting the editing procedure, check if the unit is set to the Multi Timbral mode (the indicator of **MULTI TIMBRAL** is lit).



1 **Call the Keyboard display.**

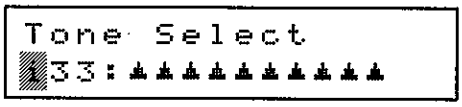
If you do not select a part which can be played by the keyboard, you cannot listen to the sound being edited.

2 **Select the Timbre to be edited.**

3 **Press [EDIT].**

```
Edit Select
Timbre   Tone
```

4 **Press ◄/LOWER to turn to "Timbre".**



5 **Select the parameter to be edited with ◄DISPLAY►.**
Pressing ► will advance the display, while ◄ will move to the previous displays.

- Tone Select
- Key Shift
- Fine Tune
- Bender Range
- Assign Mode

6 **Change the value using ◄VALUE►.**
While the value is being edited, it keeps blinking.

* If you wish to hear the Timbre as it sounded before editing it, press COMPARE during editing. Pressing it again will return to the editing mode.

7 **To continue, and set a different parameter, repeat steps 5 and 6.**

* To leave the editing mode, press EXIT and return to Play mode.

8 **To write the edited version into memory, take the following writing procedure.**

c. Writing procedure

Whenever you are finished editing and want to be able to use the settings again, write them into the internal memory or onto an optional memory card.
This section explains how to write into the internal memory. To write onto a memory card, read "Writing Data onto a memory card" on page 118 in the EDIT volume.

To write data into the internal memory, specify the destination Timbre number where the edited data is to be written. It is best to select the destination Timbre so that you can easily manage the Timbres later. For instance, you can arrange the Timbres in the same order as they will be played, or group together the same type of sounds. (By repeating the writing procedure, you can rearrange the order of Timbres.)
Writing data will automatically rewrite any previous Timbre. To retain the existing data, save it onto a memory card.

■ Memory Protect

The D-5 features the Memory Protect function that protects data in memory from accidental erasure. Memory Protect is default to ON. To write data into memory, turn the Memory Protect of the D-5 to off.
There are two different methods for turning Memory Protect off as follows.

● Temporary Protect Off

Temporary Protect Off is used for turning the memory protect function off only at the time of the actual write, then automatically returning it to Protect on. This type of Protect OFF will be sufficient if you need to turn off the memory protect just once, such as when writing edited data. How to set the Temporary Protect Off is explained on page 112 "Writing into the Internal Memory".

● Normal Protect Off

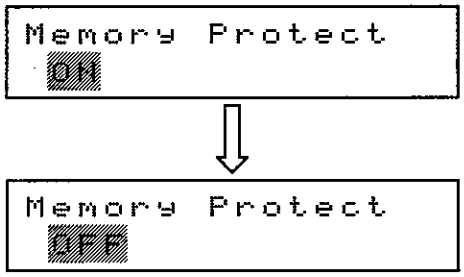
This is a normal type Protect Off that is retained until you turn it off, and therefore may be required when you need to write repeatedly.

To turn the Normal Protect off, do as follows.

1 **Press [TUNE/FUNCTION].**

2 **Press [◄]DISPLAY[►] to call the Memory Protect display.**

3 **Set the Memory Protect to "OFF" using the [◄]VALUE[►].**



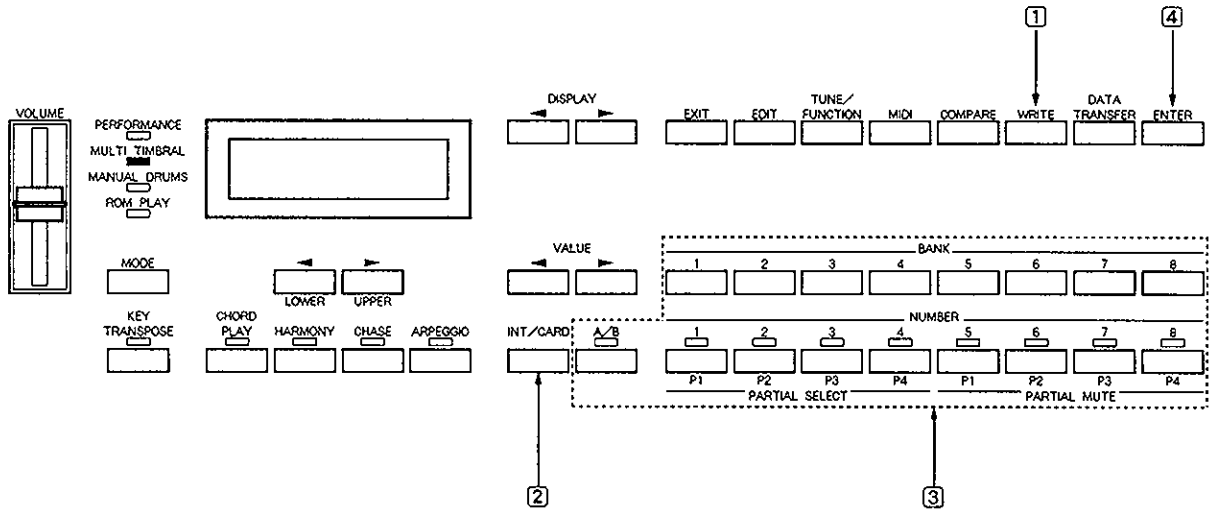
* Every time you finish writing, be sure to return Memory Protect to "ON", using a procedure similar to the above.

4 **Press [EXIT] to return to the previous display.**

* When the unit is switched off, the Memory Protect state is returned to ON.

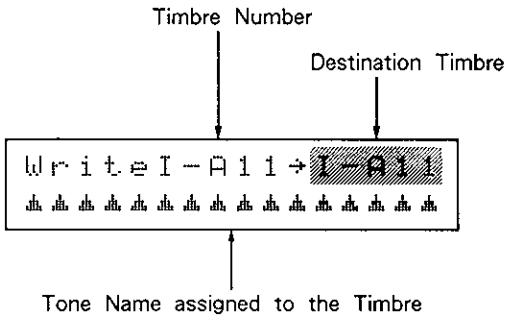
■ Writing data into the internal memory

To write an edited Timbre into the internal memory : You can enter the Timbre writing mode from Timbre editing (in any Timbre parameter display) or from play in the Multi Timbral mode.



1 **Press [WRITE].**

The Writing display is called.



2 **When you have been editing a Timbre on a memory card, change from the Card "C" to Internal "I" by pressing [INT/CARD].**

* When writing a Timbre on a memory card into the internal memory, when a Tone in the c group has been used, it will automatically change to an i group Tone. (See page 103 "Relation between Timbre and Tone".) Therefore, if the make-up of the Tone in the internal memory is different from the Tone on the memory card, the Timbre will be consequently affected.

3 **Specify the destination Timbre number where the edited version is to be written, using A/B, BANK 1 to 8, NUMBER 1 to 8.** To write to the same location, skip this.

If you wish to listen to the destination Timbre before overwriting it, do as follows.

①Press COMPARE.

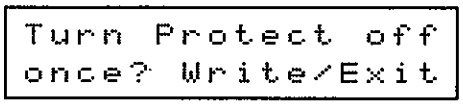
Now, the selected Timbre can be heard by playing any key on the keyboard. At this stage, you can listen to a different Timbre by changing Timbres.

②Press COMPARE to return to the Writing display.

4 **Press ENTER.**

○If the Memory Protect was turned OFF, the display responds as shown below for a while, then returns to a Play mode display.

○If the Memory Protect has remained ON, the display responds as shown below.



If you wish to set the Temporary Protect OFF, press WRITE then ENTER.

* If you press EXIT before the writing is not yet completed, the unit will be returned to the Timbre Editing display. At this stage, if you wish to continue writing, press WRITE again. If you change Timbres without pressing WRITE, the edited data will be lost.

* When the write was not successful, an error message will appear. See page 144 "Error Messages" in the EDIT volume to resolve it.

3 RHYTHM SETUP

This section explains how to change the rhythm assignment to key numbers, and how to play each rhythm voice. You can match the rhythm voice assignment of the performance data recorded in a sequencer to that of the D-5, or change the volume balance of rhythm voices.

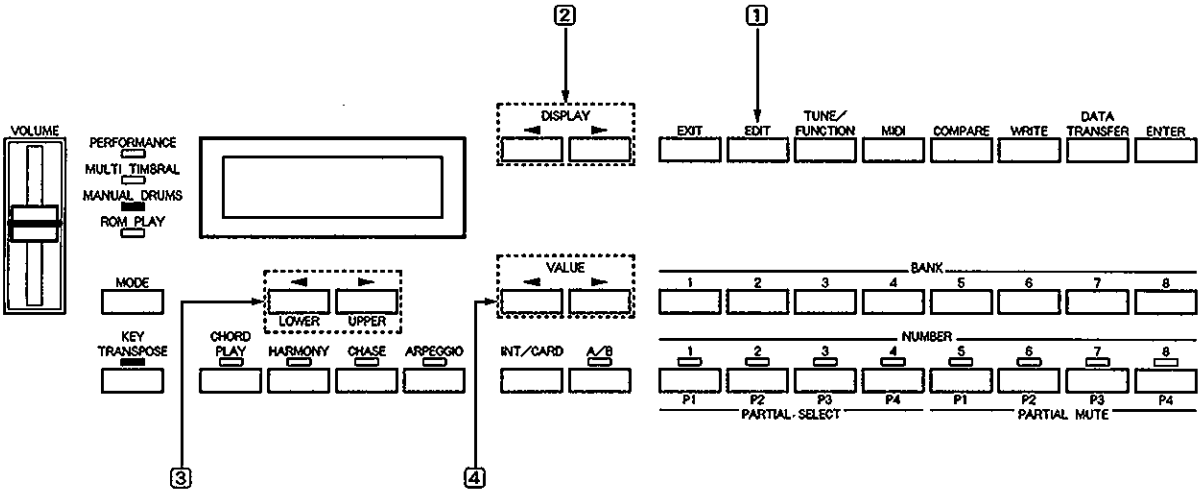
Rhythm Tones can be assigned to Key Numbers C1 to C8. When external Note (Key) messages are received by the Rhythm Part, or when the keyboard of the D-5 is played in the Manual Drums mode, the Rhythm Tone assigned to that Key Number is played, resulting in rhythm performance.
Each Key Number can have an independent Pan and Level, allowing rhythm performance at the desired balance. In addition to the Preset Rhythm Tones (63 kinds), original Tones you have programmed can also be used as Rhythm Tones.

1. Editing Procedure

Rhythm Tone editing includes Tone, Level and Pan settings for each Key Number.

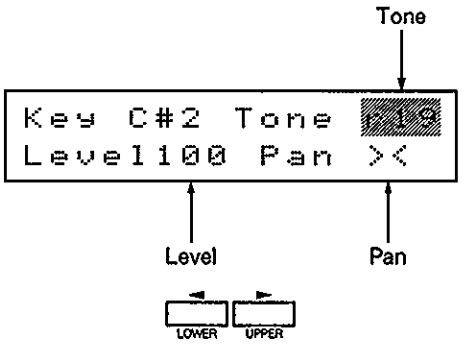
* The editing procedure does not automatically rewrite old data. Therefore, the edited data will be erased if the unit is switched off. To retain the edited version, take an appropriate writing procedure for each Key Number.

Before starting the editing procedure, check if the unit is set to the Manual Drums mode (the indicator of **MANUAL DRUMS** is lit).



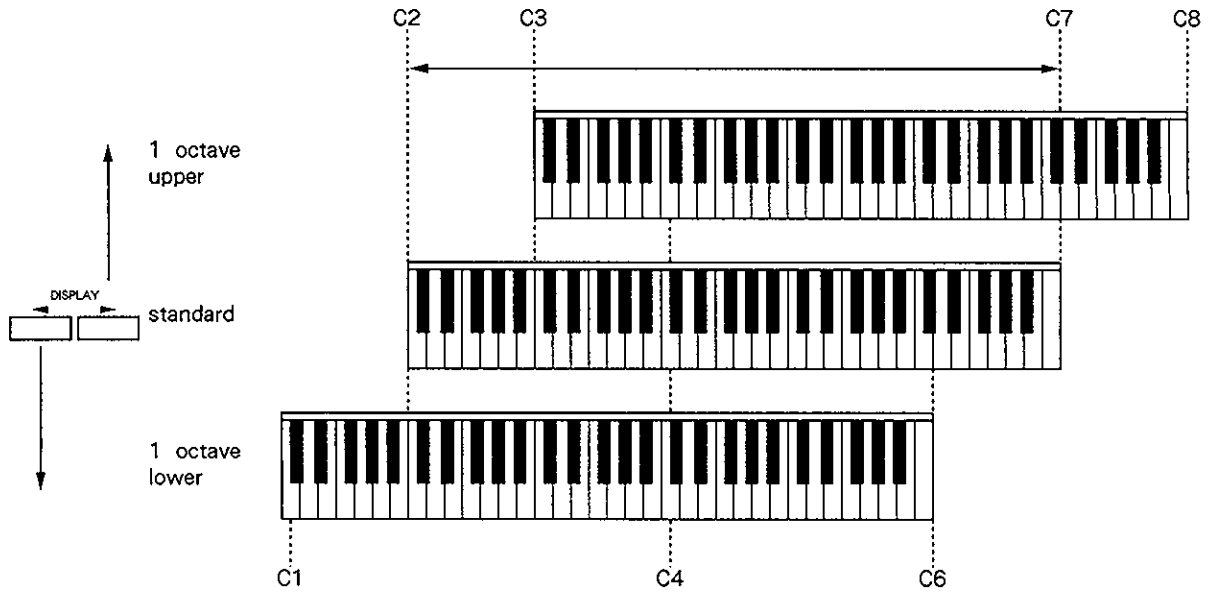
1 **Press [EDIT].**
Play the keyboard, and the relevant rhythm Tone will be heard.

2 **Press the key to be edited.**
The Tone, Level and Pan set in that key will be displayed.



To select a key that exceeds the maximum range of the keyboard (C1—B1, C#7—C8), transpose the pitch of the keyboard using [◄DISPLAY►], before assigning the key. When the keyboard is transposed, the Key Transpose Indicator lights up.

III-3



3 **Press ◄/LOWER /UPPER► to select the parameter to be edited.**
The value of the selected parameter will blink.

4 **Edit the value with ◄VALUE►.**

Tone : A Rhythm Tone can be selected from the Preset Rhythm Tones r1 to r63 and Internal Tones i1 to i64. At OFF, no Rhythm Tone is assigned.

Level : 0 to 100 are valid, higher values increase the volume.

Pan : The positioning of the sound image in the stereo output can be set from 7> to <7. At ><, the position is in the center, <7 the far right and >7 the far left.

* Changing the Pan value may not affect the sound as expected in some Tones because of the Structure setting (page 123).

* When using a Tone made of only one Partial, only 8 panning positions are available.

* When a Rhythm Tone from the internal memory is used, the pitch may be changed depending on the key assigned to the Tone.

5 **To write the edited version into memory, take the following writing procedure.**
To leave the editing mode, press EXIT and return to the Manual Drums mode.

[Preset Rhythm Tones]

No.	Rhythm Tones	Number of Partials
r01	Closed High Hat – 1	1
r02	Closed High Hat – 2	1
r03	Open High Hat – 1	2
r04	Open High Hat – 2	2
r05	Crash Cymbal	2
r06	Crash Cymbal (short)	1
r07	Crash Cymbal (mute)	1
r08	Ride Cymbal	2
r09	Ride Cymbal (short)	1
r10	Ride Cymbal (mute)	1
r11	Cup	2
r12	Cup (mute)	1
r13	China Cymbal	2
r14	Splash Cymbal	1
r15	Bass Drum – 1	2
r16	Bass Drum – 2	1
r17	Bass Drum – 3	2
r18	Bass Drum – 4	1
r19	Snare Drum – 1	1
r20	Snare Drum – 2	1
r21	Snare Drum – 3	1
r22	Snare Drum – 4	2
r23	Snare Drum – 5	1
r24	Snare Drum – 6	1
r25	Rim Shot	1
r26	Brush – 1	2
r27	Brush – 2	2
r28	High Tom Tom – 1	1
r29	Middle Tom Tom – 1	1
r30	Low Tom Tom – 1	1
r31	High Tom Tom – 2	1
r32	Middle Tom Tom – 2	1
r33	Low Tom Tom – 2	1
r34	High Tom Tom – 3	2
r35	Middle Tom Tom – 3	2
r36	Low Tom Tom – 3	2
r37	High Pitch Tom Tom – 1	1
r38	High Pitch Tom Tom – 2	1
r39	Hand Clap	1
r40	Tambourine	1
r41	Cowbell	1
r42	High Bongo	1
r43	Low Bongo	1
r44	High Conga (mute)	1
r45	High Conga	1
r46	Low Conga	1
r47	High Timbale	1
r48	Low Timbale	1
r49	High Agogo	1
r50	Low Agogo	1
r51	Cabasa	1
r52	Maracas	1
r53	Short Whistle	2
r54	Long Whistle	2
r55	Quijada	3
r56	Claves	1
r57	Castanets	2
r58	Triangle	2
r59	Wood Block	1
r60	Bell	2
r61	Native Drum – 1	1
r62	Native Drum – 2	1
r63	Native Drum – 3	1
OFF		0

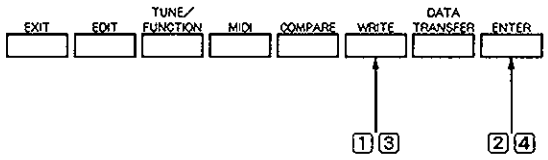
[Preprogrammed Rhythm Setup]

Rhythm Tones (Tone No.)		Note Number	
Native Drum – 3	(r63)	97	
Native Drum – 2	(r62)	96	C7
Native Drum – 1	(r61)	95	
Ride Cymbaal (short)	(r09)	94	
High Tom Tom – 3	(r34)	93	
Crash Symbal (short)	(r06)	92	
Middle Tom Tom – 3	(r35)	91	
Closed High Hat – 2	(r02)	90	
Low Tom Tom – 3	(r36)	89	
Snare Drum – 6	(r24)	88	
Snare Drum – 5	(r23)	87	
Snare Drum – 4	(r22)	86	
Bass Drum – 4	(r18)	85	
Bass Drum – 3	(r17)	84	C6
Bell	(r60)	83	
Wood Block	(r59)	82	
High Pitch Tom Tom – 1	(r37)	81	
Triangle	(r58)	80	
High Pitch Tom Tom – 2	(r38)	79	
Castanets	(r57)	78	
Brush – 2	(r27)	77	
Brush – 1	(r26)	76	
Claves	(r56)	75	
Cup (mute)	(r12)	74	
Quijada	(r55)	73	
Long Whistle	(r54)	72	C5
Short Whistle	(r53)	71	
Maracas	(r52)	70	
Cabasa	(r51)	69	
Low Agogo	(r50)	68	
High Agogo	(r49)	67	
Low Timbale	(r48)	66	
High Timbale	(r47)	65	
Low Conga	(r46)	64	
High Conga	(r45)	63	
High Conga (mute)	(r44)	62	
Low Bongo	(r43)	61	
High Bongo	(r42)	60	C4
Ride Cymbal (mute)	(r10)	59	
Snare Drum – 3	(r21)	58	
Crash Cymbal (mute)	(r07)	57	
Cowbell	(r41)	56	
Splash Cymbal	(r14)	55	
Tambourine	(r40)	54	
Cup	(r11)	53	
China Cymbal	(r13)	52	
Ride Cymbal	(r08)	51	
High Tom Tom – 2	(r31)	50	
Crash Cymbal	(r05)	49	
High Tom Tom – 1	(r28)	48	C3
Middle Tom Tom – 2	(r32)	47	
Open High Hat – 1	(r03)	46	
Middle Tom Tom – 1	(r29)	45	
Open High Hat – 2	(r04)	44	
Low Tom Tom – 2	(r33)	43	
Closed High Hat – 1	(r01)	42	
Low Tom Tom – 2	(r30)	41	
Snare Drum – 2	(r20)	40	
Hand Clap	(r39)	39	
Snare Drum – 1	(r19)	38	
Rim Shot	(r25)	37	
Bass Drum – 2	(r16)	36	C2
Bass Drum – 1	(r15)	35	

2. Writing Procedure

This section explains how to write the edited rhythm setting to each Key Number.

When you have edited rhythm data, take the following procedure.



1 **Press WRITE.**

```
Write C#2 Setup
Sure?          Enter
```

2 **Press ENTER.**

If the Memory Protect has remained ON, the display will respond as shown below.

If the Memory Protect has been turned OFF, writing will be done then the editing display is retrieved.

```
Turn Protect off
once? Write/Exit
```

* To leave the editing mode, press EXIT to return to the previous editing display.

3 **Press WRITE.**

The unit is set to Temporary Memory Protect Off and returns to the display of 1.

4 **Press ENTER.**

When the writing is properly done, the display responds as shown below, then returns to the editing display.

```
Completed
```

4 TONE SETTING

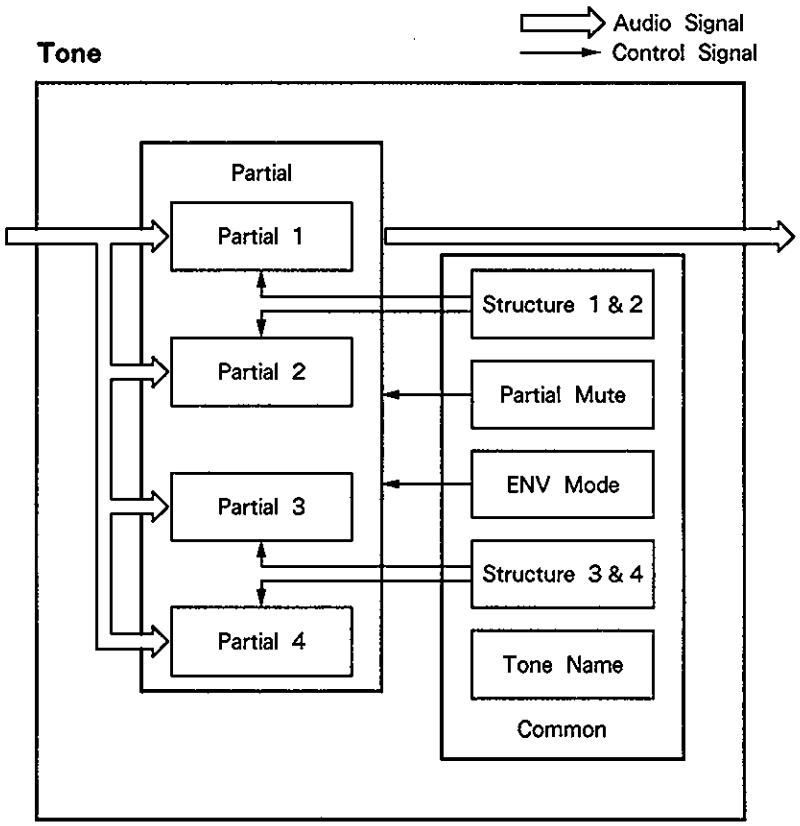
A Tone consists of various parameters. This section explains the basic concept of a Tone and simple Tone editing.

1. What is a Tone?

A Tone is a unit of sound. As mentioned before, a Timbre, Patch or Rhythm Voice is made of a Tone or Tones. The following explains how a Tone is structured.

a. The structure of a Tone

A Tone consists of four Partials and a Common block.

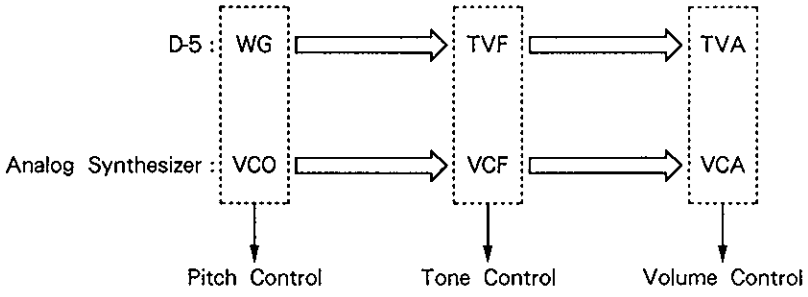


■ Partial

Partials are combined in pairs, and two pairs of partials form a Tone. One Partial can be thought of as functioning much like a conventional synthesizer.

It has been difficult to create realistic acoustic sounds with synthesizers of the past, because an acoustic sound is comprised of many different sounds. For instance, a piano sound consists of the attack portion, sustained portion, decaying portion, and remaining portion. Also, pitch (sound range) is another element that causes tone alteration in one sound.
Conventional synthesizers used to make such complicated sounds from one waveform, but the D-5 creates a sound by making different portions of the sound in Partials, then combines those.

Each Partial has a Wave Generator (WG), Time Variant Filter (TVF), and Time Variant Amplifier (TVA). These function similarly to the VCO, VCF and VCA of an analog synthesizer.



Partials can use either of two sound generators, Synthesizer Sound Generator or PCM Sound Generato. "Structure" selects which of the two sound generators is to be used.
Depending on which generator is selected, different parameters will be used. Some parameters used for the synthesizer sound generators are irrelevant to the PCM generator.

Synthesizer Sound Generator :
This Sound Generator behaves like a conventional analog synthesizer, where you can make sounds using sawtooth waves or square waves.

PCM Sound Generator :
This allows you to make sounds using PCM sounds. There are 256 attractive preprogrammed PCM sounds.

● **Wave Generator (WG)** In the Wave Generator, the basic pitch and waveform are controlled. The envelope curve for pitch or vibrato are also controlled.

● **Time Variant Filter (TVF)**
This filter processes the basic waveform of the synthesizer sound generator set in the WG and changes tones. The envelope curve of a tone is also controlled.
The sound sources of the PCM sound generator have their own tones, and therefore cannot be controlled with the TVF.

● **Time Variant Amplifier (TVA)**
This controls the volume. Control of the envelope curve of the level change is more important than control of the basic volume. Attack, sustain and decay portions of a sound are set here.

■ Structure

A Tone consists of up to four Partials. An important parameter in the Common group called "Structure" decides how each Partial should be combined or which sound generator should be used.

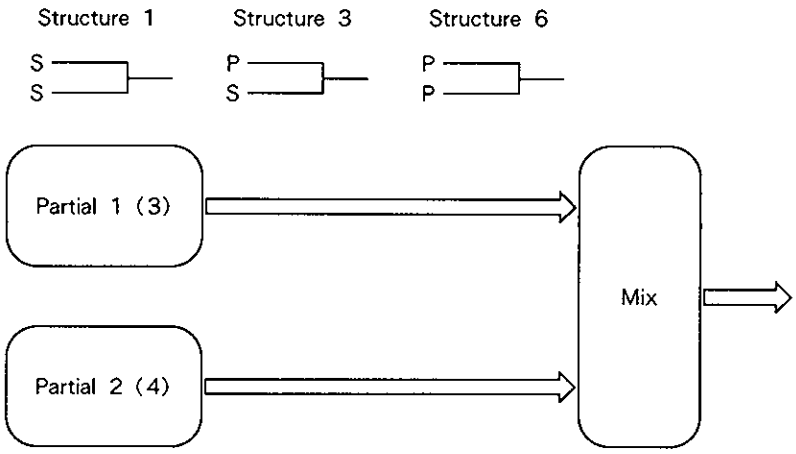
Functions of Structure

①Selects which of the sound generators ;
synthesizer sound generator or PCM sound generator, is to be used in each Partial.

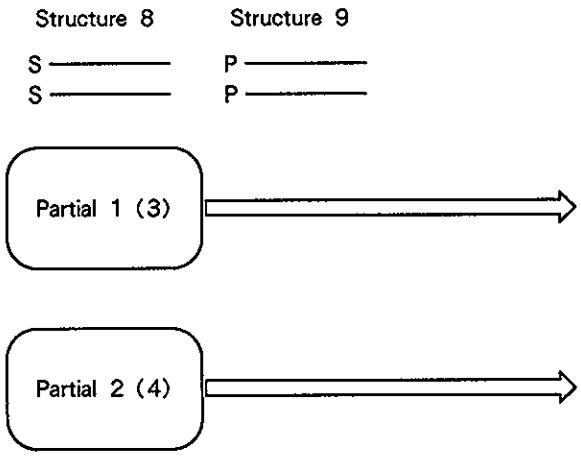
②Decides how each pair of Partials should be combined.
The four Partials are combined in pairs and two pairs of Partials form a Tone. There are two Structures in each Tone, to decide how the two pairs should be made from the four Partials. Structures 1 & 2 determine how to combine Partials 1 and 2, and Structures 3 & 4 determine how to combine Partials 3 and 4.

There are four different ways to combine Partials.

○Two Partials are mixed



○Two Partials are output in stereo

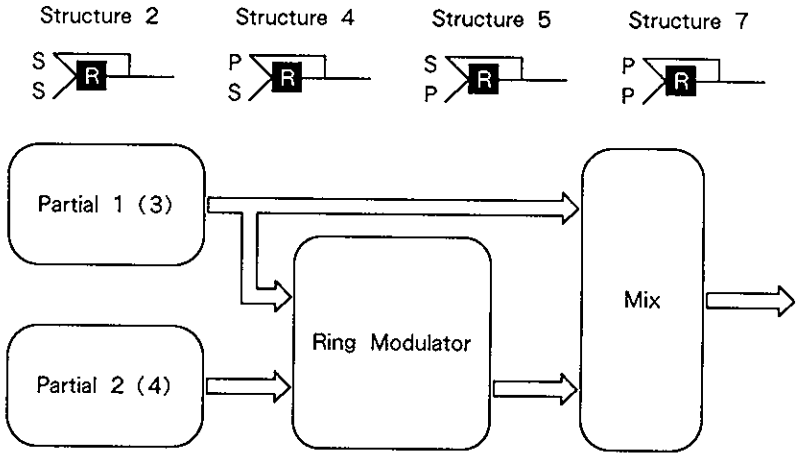


This combination is effective for playing Timbres or Rhythm Tones in stereo. However, if using this setting in mono output, it will be mixed on output (same as above).

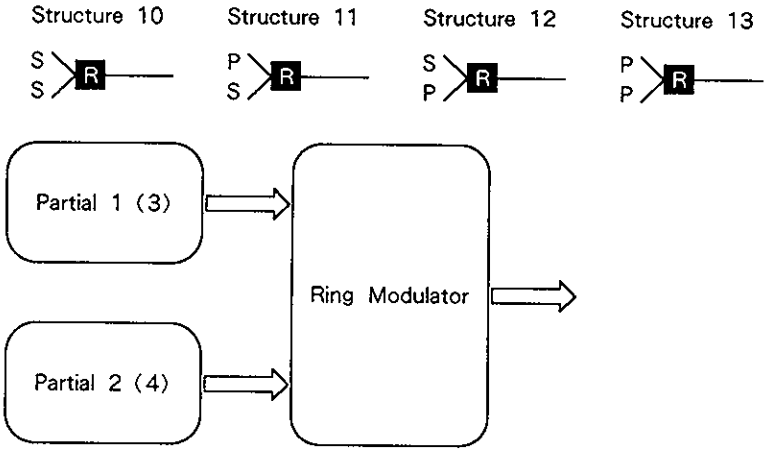
* When this Structure is selected, the sound placement of each Partial is automatically set as follows depending on the Pan setting. (See page 69 "Pan and Level".)

Value of Pan	Actual Value	
	Partial 1 (3)	Partial 2 (4)
<7	<7	<7
<6	<5	<7
<5	<3	<7
<4	<1	<7
<3	1>	<7
<2	3>	<7
<1	5>	<7
><	7>	<7
1>	7>	<5
2>	7>	<3
3>	7>	<1
4>	7>	1>
5>	7>	3>
6>	7>	5>
7>	7>	7>

○Partial 1 (3) is mixed with the ring modulated sound of two partials.



○Two Partials are ring-modulated and sent out.



* The Ring Modulator can be effectively used for creating metallic sounds, since it can increase harmonics by multiplying two Partials.

The D-5 provides 13 different Structures numbered 1 through 13. Select any of these.

S : Synthesizer Sound Generator
P : PCM Sound Generator

Structure Number	Partial 1 (3)	Partial 2 (4)	Combination of two Partials	Block Diagram
1	S	S	Mixture of Partial 1 (or 3) and Partial 2 (or 4).	
2	S	S	Mixture of Partial 1 (or 3) and ring-modulation.	
3	P	S	Mixture of Partial 1 (or 3) and Partial 2 (or 4).	
4	P	S	Mixture of Partial 1 (or 3) and ring-modulation.	
5	S	P	Mixture of Partial 1 (or 3) and ring-modulation.	
6	P	P	Mixture of Partial 1 (or 3) and Partial 2 (or 4).	
7	P	P	Mixture of Partial 1 (or 3) and ring-modulation.	
8	S	S	Partial 1 (or 3) and Partial 2 (or 4) are output in stereo.	
9	P	P	Partial 1 (or 3) and Partial 2 (or 4) are output in stereo.	
10	S	S	Partial 1 (or 3) and Partial 2 (or 4) are ring-modulated then output.	
11	P	S	Partial 1 (or 3) and Partial 2 (or 4) are ring-modulated then output.	
12	S	P	Partial 1 (or 3) and Partial 2 (or 4) are ring-modulated then output.	
13	P	P	Partial 1 (or 3) and Partial 2 (or 4) are ring-modulated then output.	

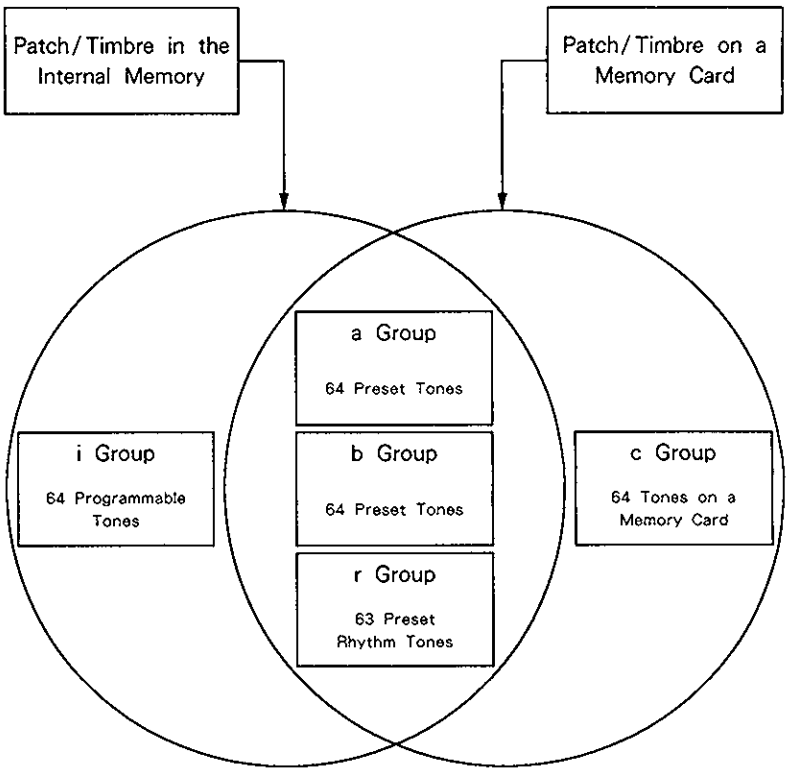
2. Editing Procedure

You can edit a Tone either in the Performance mode or Multi Timbral Mode.

There are various Tone groups, a, b, r, i and c. The Tones available for a Timbre or Patch differ depending on which memory, the internal memory or memory card, they belong to.

An edited Tone can be written into a Tone in group i or group c (RAM card). It cannot be written into the a, b, or r groups.

* The editing procedure does not automatically rewrite old data. Therefore, the edited data will be erased if the unit is switched off. To retain the edited version, take an appropriate writing procedure (page 140).



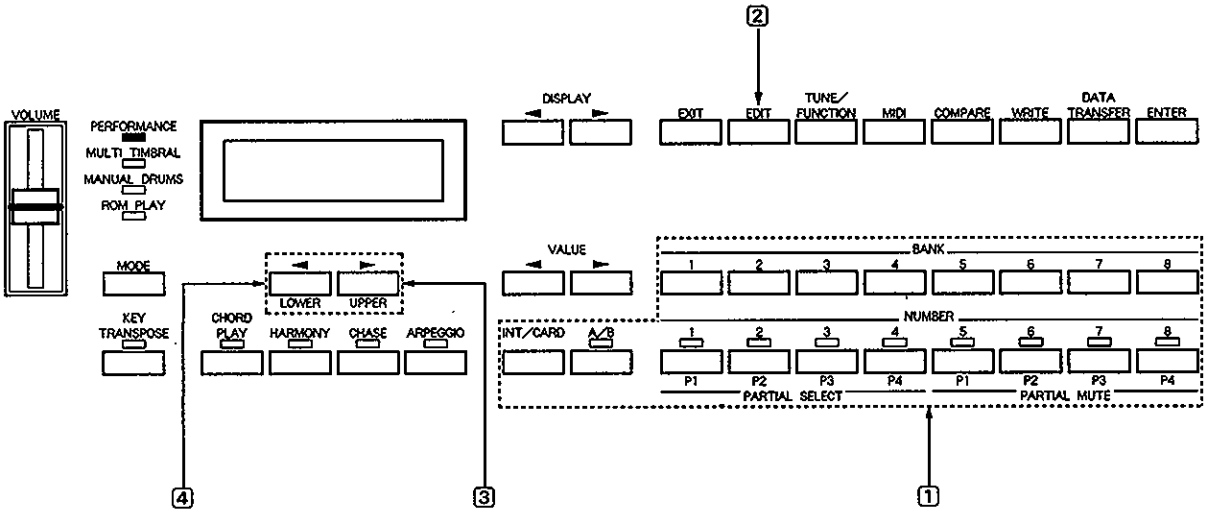
a. Basic editing procedure

Select a Patch/Timbre which is similar to the sound you wish to make, and edit it. The following explains the basic procedure for Tone editing.

■ Tone Selection

The method of selection for a Tone to be edited differs between the Performance mode and Multi Timbre mode.

● How to select a Tone in the Performance Mode



1 **Select the Patch that contains the Tone you want.**

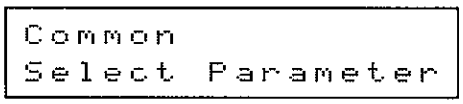
2 **Press [EDIT].**

```
Edit Select
Patch    Tone
```

3 **Press [UPPER/►] to select "Tone".**

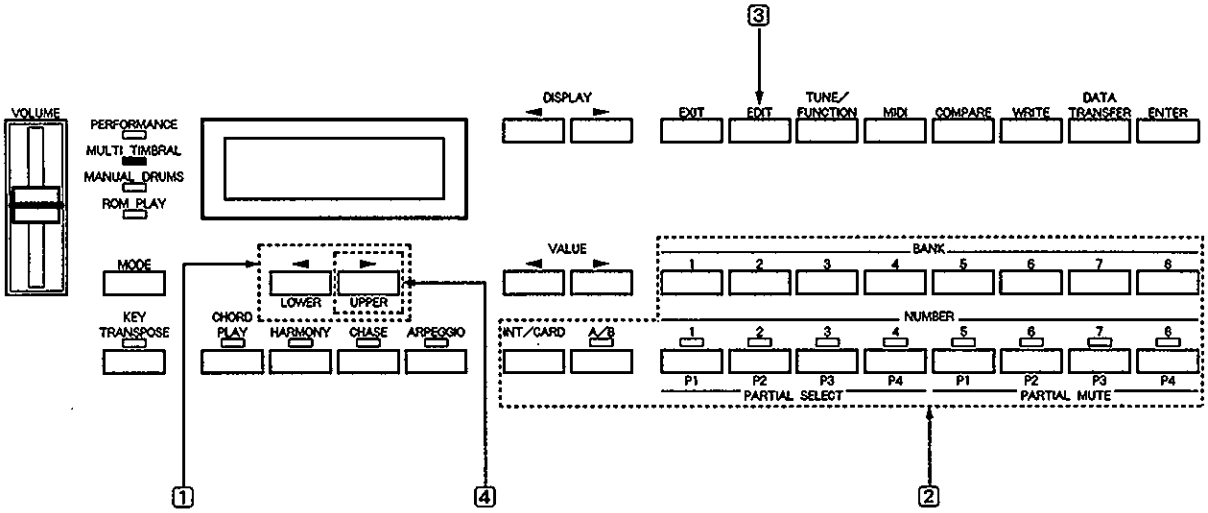
```
Edit Tone Select
Lower    Upper
```

4 **To edit the Lower Tone, press [◄/LOWER], and to edit the Upper Tone, press [UPPER/►].**



The Tone editing display appears.
Go to the following "How to select a parameter and edit it".

● How to select a Tone in the Multi Timbral Mode



1 **Turn to the Keyboard display.**
If you do not select a part which can be played by the keyboard, you cannot listen to the sound being edited.

2 **Select the Timbre that contains the Tone you want.**

3 **Press [EDIT].**

```
Edit Select
Timbre   Tone
```

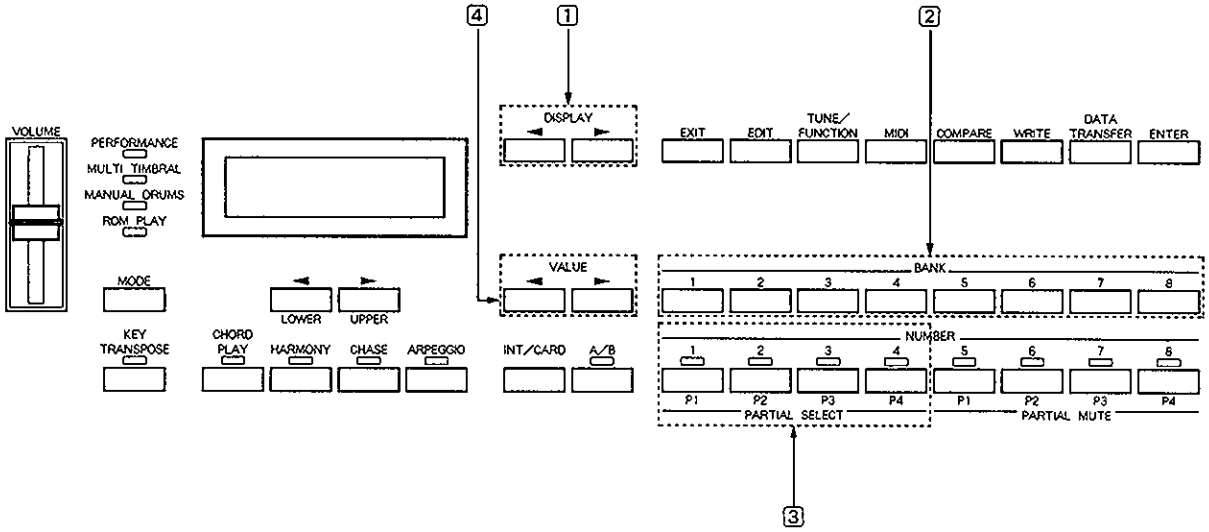
4 **Press [UPPER/▶] to select "Tone".**

```
Common
Select Parameter
```

The Tone editing display appears.
Go to the following "How to select a parameter and edit it".

■How to select a parameter and edit it

The following explains how to edit the values of a parameter.



1 Press ◄DISPLAY► to call the group that contains the parameter you wish to edit.

Parameters are divided into the following eight groups.

①Common Group

This group includes Structure, ENV Mode, Tone Name etc.

②WG Pitch/Modulation Group

This group controls the basic Pitch, Vibrato, Pitch Bender, etc.

③WG Form/Pitch Envelope Group

This group sets the Waveform and how to use the Pitch Envelope etc.

④WG Pitch Envelope Group

This sets the envelope of pitch.

⑤TVF Frequency Group

This group sets how to change the sounds of the synthesizer sound generator. However, the parameters in this group do not affect the PCM sound generator at all.

⑥TVF Envelope Group

This group sets the envelope of tone. The parameters in this group do not work on the PCM sound generator.

⑦TVA Level Group

This group sets the basic Volume, volume change caused by Key Follow and Velocity, etc.

⑧TVA Envelope Group

This group controls the envelope of volume.

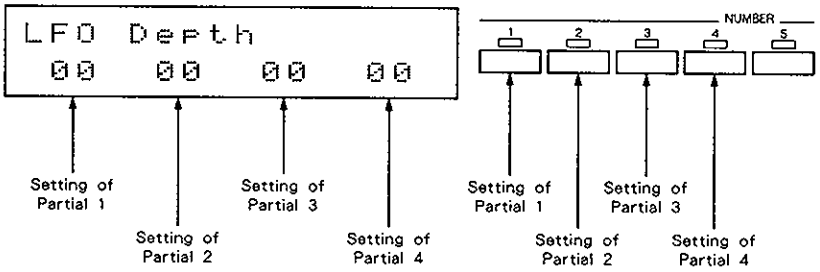
[2] Select the parameter to be edited by using BANK [1]—[8].
Parameters correspond to the **BANK** as shown below.

Group	BANK 1	2	3	4	5	6	7	8
Common	Tone Name	Structure 1 & 2	Structure 3 & 4	ENV Mode				
WG Pitch/ Modulation	Pitch Coarse	Pitch Fine	Key Follow (Pitch)	LFO Rate	LFO Depth	LFO Modulation Sensitivity	Bender Switch	
WG Form/ Pitch ENV	Waveform	PCM Wave Bank	PCM Wave No.	Pulse Width	PW Velocity	ENV Depth	ENV Velocity	ENV Key Follow (Time)
WG Pitch ENV	Time 1	Time 2	Time 3	Time 4	Level 0	Level 1	Level 2	End Level
TVF Frequency	Cutoff Frequency	Resonance	Key Follow	Bias Point	Bias Level	ENV Depth	ENV Velocity	ENV Key Follow (Depth)
TVF ENV	Key Follow (Time)	Time 1	Time 2	Time 3	Time 4	Level 1	Level 2	Sustain Level
TVA Level	Level	Velocity	Bias Point 1	Bias Level 1	Bias Point 2	Bias Level 2	ENV Velocity Follow(Time1)	
TVA ENV	Key Follow (Time)	Time 1	Time 2	Time 3	Time 4	Level 1	Level 2	Sustain Level

DISPLAY ◄ ► DISPLAY

If you have selected Partial parameters, the values of the four Partial parameters are shown in the display.

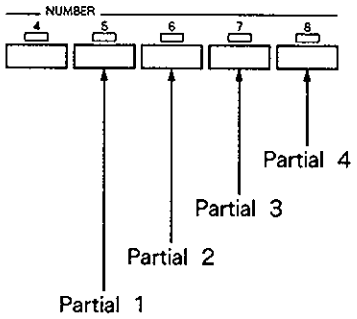
3 **Select the Partial to be edited with NUMBER 1—4.**
The indicator of the pressed button will light up, and the value (blinking) of the parameter can be edited. Each time you press a button, the corresponding indicator lights up and goes out alternately. It is possible to edit more than one Partial simultaneously.



●Partial Mute

The Partial Mute is one of the Tone parameters that allows you to mute each Partial by pressing the corresponding **NUMBER** 5—8. The Partial whose NUMBER button stays dark is not being used. The Partial Mute state also determines the number of Partials active in the Tone. That is, the maximum number of voices that can be played changes depending on how many Partials are currently in use.

Pressing a button will turn off (the indicator lights up) and on (the indicator goes out) the Mute function of the corresponding Partial. You may use this function to compare two Partials, as well as for muting Partials to listen to only specific Partials.



* Parameters of the Partial currently muted can be edited just the same.

* When the Ring Modulator is in use, muting one of the Partials used will cause the other unmuted Partial to be output without passing through the Ring Modulator.
To check the effect of the Ring Modulator, you must turn mute off of the corresponding Partial.

4 **Change the value of the selected parameter with [◄]VALUE[►].**
To edit more than one Partial with Partial Select, the value of each Partial can be edited relatively. For instance, if you edit two partials whose values are 03 and 15 at the same time, the values change as 04 and 16, 05 and 17, 06 and 18, etc.

* If you wish to listen to the Tone as it was before being edited, press [COMPARE]. To return to the editing mode, press [COMPARE] again.

* To leave the editing mode, press [EXIT]. If you have not written the edited data, the previous data will be retrieved the moment you select a different Tone.

5 **To write the edited version into memory, take the appropriate writing procedure (page 140).**

b. Simple editing

For easier and quicker editing, you may select a Tone which is similar to the sound you wish to create, and edit a part of the data. This section explains key points for effective Tone editing.

■Check the following before Tone editing

Before actually editing a Tone, check the following points to study how the Partials are being used. If you do not understand the structure of the Partials, you cannot tell which Partials to edit.

①Check the Key Mode

When entering Tone editing from the Performance mode, you may not be able to make a desired sound if editing a Tone only.

Specifically, in the Dual mode, this is a very important check point because Dual mixes two Tones to make one Tone. In the Dual mode, check how each Tone works by changing the Tone Balance, etc. (After you have checked, return the parameters to the previous values.)

②Check the Partial Mute

First, Check which Partials are currently muted. This is important because the muted Partials are, naturally, not used in the Tone.

The Partial Mute function will be quite often used during editing, therefore, it may be wise to make a memo unless you have a very good memory.

③Check Partials

Secondly, using the Partial Mute function, listen to the sound of each Partial in use to check how Partials work in the Tone.

There are many different Partial combinations.

The following are common examples :

- Combination of the same types of sounds
- Combination of attack and sustain portions
- Combination of the lower and upper sound range of the keyboard
- Combination of the strongly and weakly hit keys

④Check the Structure

Finally, check the Structure setting.

Check how each Partial is used, how the Partials are combined and how the Ring Modulator functions. Particularly when the PCM sound generator is used, you must be careful, as the functions of some parameters, such as some related to TVF, become ineffective.

When the setting of a Structure is altered, the source waveform may be changed, resulting in drastic changes in the sound.

Basically, for the best chance of success when editing, do not touch the Structure setting.

■ Change Sound

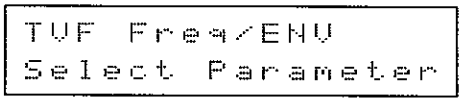
To change sound, check if the Partial to be edited uses the synthesizer sound generator or PCM sound generator with its Structure. Depending on which is used, the method of editing will differ. To be able to hear the sound change clearly, mute the other Partials.

Do as follows in the Tone Editing mode.

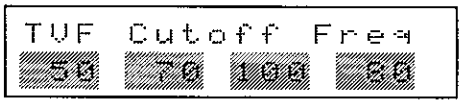
● When the Synthesizer Sound Generator is used :

Change the sound using the TVF Frequency and Resonance.

1 **Press ◄DISPLAY► to change to the TVF Frequency Group display.**



2 **Press BANK 1 to select the Cutoff Frequency parameter.**



3 **Change the value by pressing ◄VALUE►.**

The value can be set from 0 to 100.
Higher values make brighter (sharper) sound and lower values make darker (softer) sound. (If it is set too low, no sound will be heard.) How the Cutoff Frequency affects the sound is related with the Resonance, so, you must control both parameters.

4 **Press BANK 2 to select the Resonance, then change the value with ◄VALUE►.**

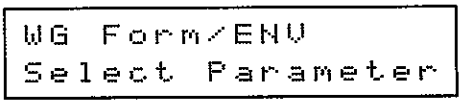
The value can be set from 0 to 30.
When the Resonance is set higher, the sound change caused by Cutoff Frequency is more conspicuous.

● **When the PCM Sound Generator is used :**

You can use any of the preprogrammed 256 PCM sounds. Each Bank (1 and 2) stores 128 PCM sounds.

* To check which PCM sounds are stored in the Banks/Numbers, see page 153 in the EDIT volume.

1 **Press ◄DISPLAY► to change to the WG Form/Pitch ENV display.**

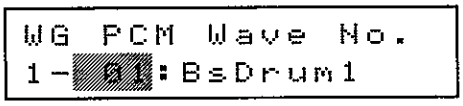


2 **Press BANK 2 to select the PCM Wave Bank.**

3 **Select a Bank, 1 or 2, by pressing ◄VALUE►.**

4 **Press BANK 3 to select the PCM Wave Number.**

When only one Partial has been selected with Partial Select, the name of the PCM sound will also be displayed.



5 **Select a PCM sound with ◄VALUE►.**

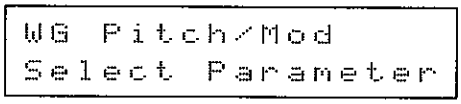
Any from 1—128 can be selected.

PCM sounds include percussive sounds such as drum, piano and flute, sustained type sounds, special effects, etc.

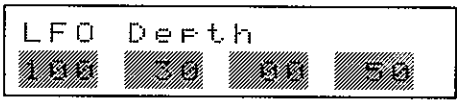
■ Create Vibrato Effect

To add deeper vibrato effect, edit the LFO Depth, and LFO Rate of the Partial that generates sustained sound. When the vibrato is controlled with the bender lever, edit the LFO Modulation Sensitivity of the Partial that generates sustained sound.

1 **Press ◄DISPLAY► to change to the WG Pitch/ Modulation display.**



2 **Press BANK 5 to select the LFO Depth.**



To control the vibrato with the bender lever, press **BANK 6** to select LFO Modulation Sensitivity.

3 **Set the depth of the vibrato ◄VALUE►.**
It can be set from 0 to 100. Higher values will make the effect deeper.

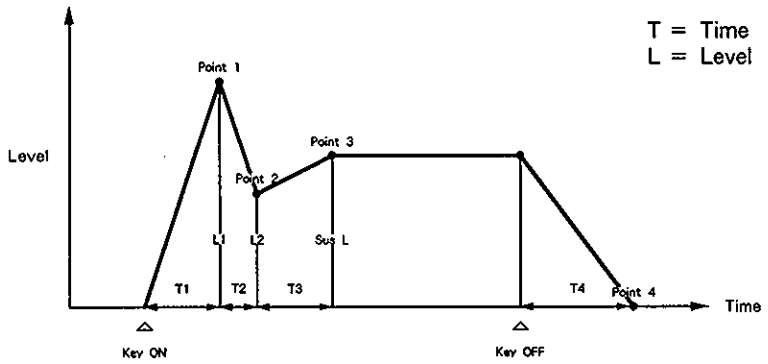
4 **Press BANK 4 to select the LFO Rate Parameter.**

5 **Set the rate of the vibrato with ◄VALUE►.**
It can be set from 0 to 100. Higher values will make the effect quicker.

■Change the Attack Time

Using a TVA envelope that controls volume, you can make the attack time of a sound longer or shorter. However, this parameter hardly affects a PCM sound as it has a fixed volume change curve.

The TVA Envelope determines the volume change in accord with the Times (T1, T2, T3 and T4) and Levels (L1, L2, and Sus L). First, check the value of each point and draw a curve.



1 **Press ◄DISPLAY► to change to the TVA ENV display.**

```
TVA ENV
Select Parameter
```

2 **Press BANK 2 to select Time 1.**

```
TVA ENV Time 1
100  80  20  00
```

3 **Change the attack time with ◄VALUE►.**

It can be set from 0 to 100. Higher values make the attack time longer and lower values make it shorter. You can go further,and edit Time 2 and Level 2 to change the attack time more.

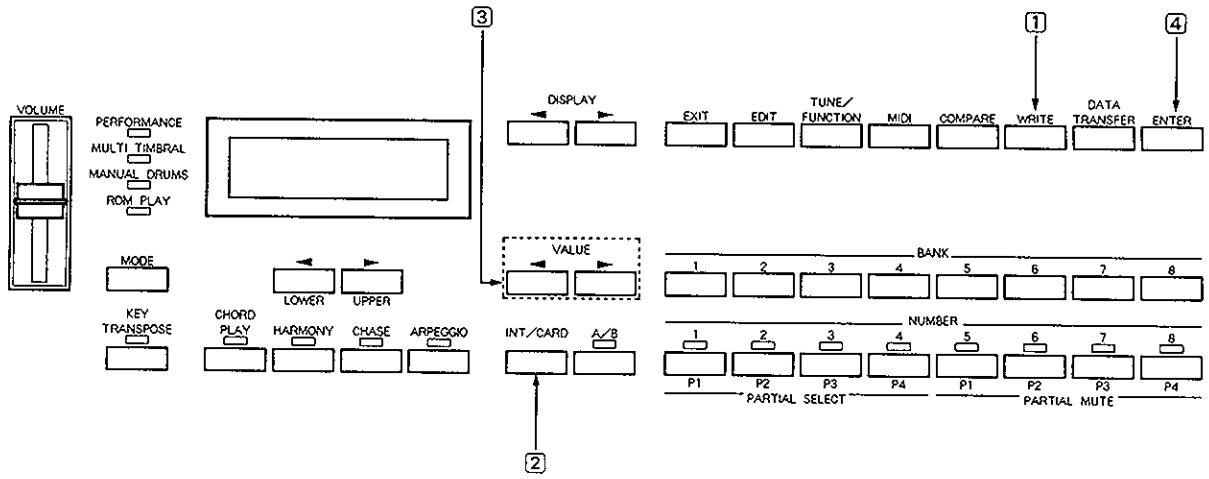
* If the level of two adjacent points are set to similar values, the time between these two points may prove to be shorter than what is actually set, or even zero.

3. Writing Procedure

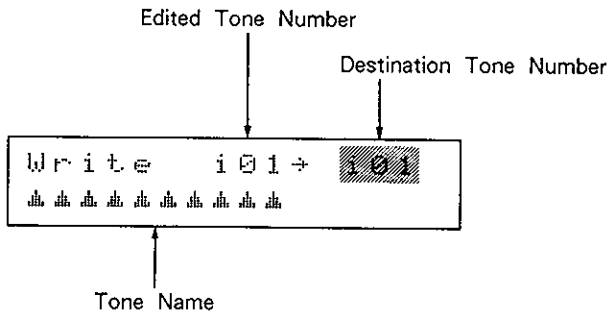
If you wish to retain the edited data for later use, write it into the internal memory or onto an optional memory card.
This section explains how to write into the internal memory. To write onto a memory card, read "Writing Data onto a memory card" on page 118 in the EDIT volume.

An edited Tone can be written into group i (internal memory) or in group c (onto a RAM card), but cannot be written into a Preset Tone in group a, b, r or onto a ROM card.

From the Tone editing mode, do as follows.



1 **Press [WRITE].**
The Tone Writing display is called.



* If you have edited a Preset Tone, the destination Tone number is not shown in the display. (✳✳✳ appears instead.)

2 **To select the destination group where the edited Tone is to be written, change from the Card (c) to Internal (i) by pressing [INT/CARD].**

3 **Specify the destination Tone number where the edited version is to be written, using [◄]VALUE[►].**
Select a Tone number from 1—64.

If you wish to listen to the destination Tone before overwriting it, do as follows.

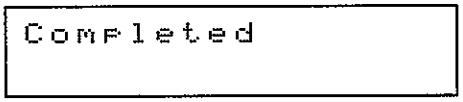
①Press [COMPARE].

Now, the relevant sound will be heard by playing any key on the keyboard. At this stage, you can listen to a different Tone by changing Tones.

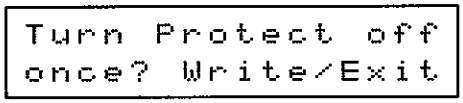
②Press [COMPARE] to return to the Writing display.

4 **Press [ENTER].**

○If the Memory Protect has been turned OFF, the display responds as shown below for a while, then returns to a Play mode display.



○If the Memory Protect remains ON, the display responds as shown below.



If you wish to set the Temporary Protect OFF, press [WRITE] then [ENTER].

* If you wish to leave the editing mode, press [EXIT] to return to the previous display.

* When the write operation was not successful, an error message will appear. See page 144 "Error Messages" in the EDIT volume to resolve it.

SPECIFICATIONS

D-5 : Multi Timbral Linear Synthesizer
(with built-in Rhythm Sound)

●Keyboard
61 Keys (With Velocity)

●Sound Source
LA System
Maximum Voices : 32 Voices

●Internal Memory
Synthesizer Section
Patches : 128
Timbres : 128
Preset Tones : 128
Programmable Tones : 64
Rhythm Section
Preset Rhythm Tones : 63
Setups : 85 Keys
(C1 to C8)

●Memory Card (M-256D, M-256E)
Patches : 128
Timbres : 128
Programmable Tones : 64
Rhythm Setups : One set

●Display
2 lines, 16 letter (back-lit)

●Dimensions
978 (W) × 279 (D) × 84 (H) mm
38-1/2″ × 11 × 3-4/8″

●Weight
6.6 kg/14 lb 8 oz

●Current Draw
800 mA (9V DC)

●Accessories
AC Adaptor
ACI-120 (120V)
ACI-220 (220V)
ACB-240A, ACB-240E (240V)
Owner's Manual (PLAY/EDIT)
Connection Cable (PJ1-M)

●Options

Memory Card (RAM)	M-256D, M-256E
Memory Card (ROM)	PN-D10 Series
Carrying Case	SHC-2
Carrying Bag	CB-10
Programmer	PG-10
Stereo Headphones	RH-100
Pedal Switch	DP-2, DP-6
MIDI/SYNC Cable	MSC-07, 15, 50, 100

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Roland

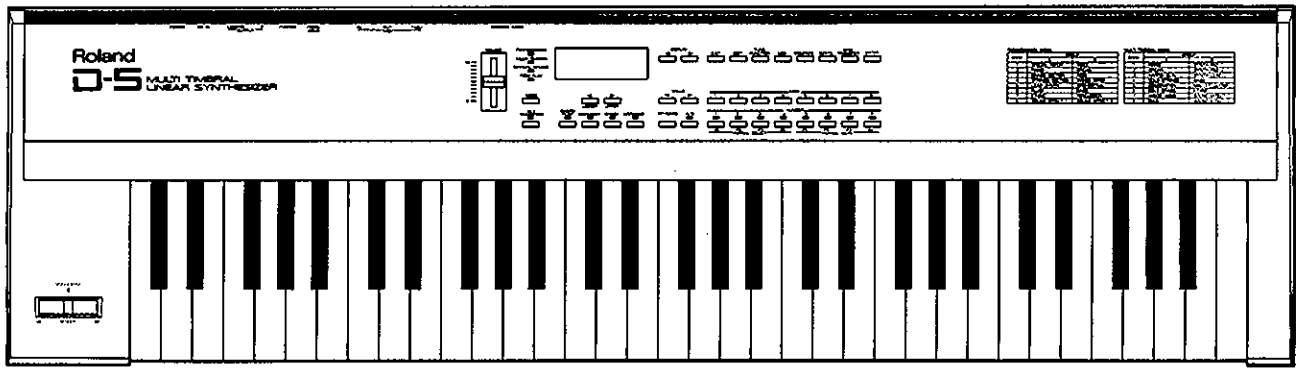
26025703 '94-8-A2-38D

Roland

MIDI MULTI TIMBRAL LINEAR SYNTHESIZER

D-5

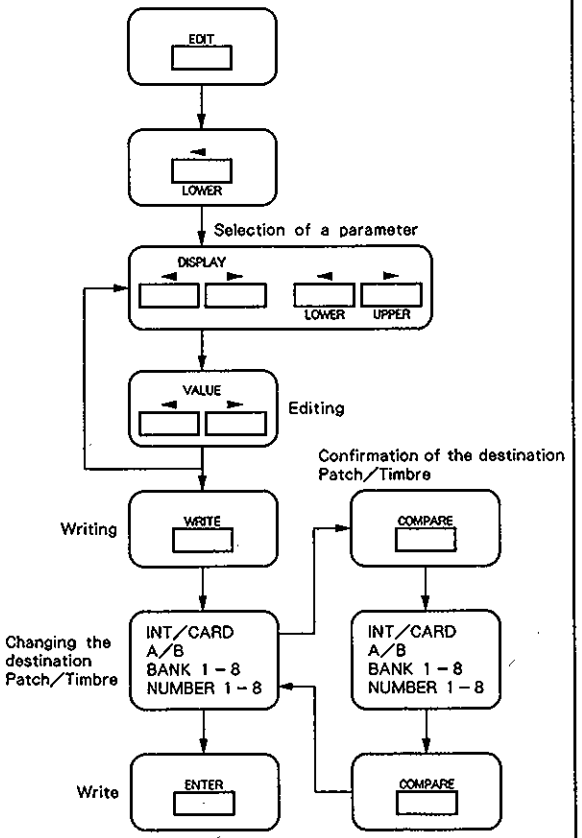
Owner's Manual (Edit Volume)



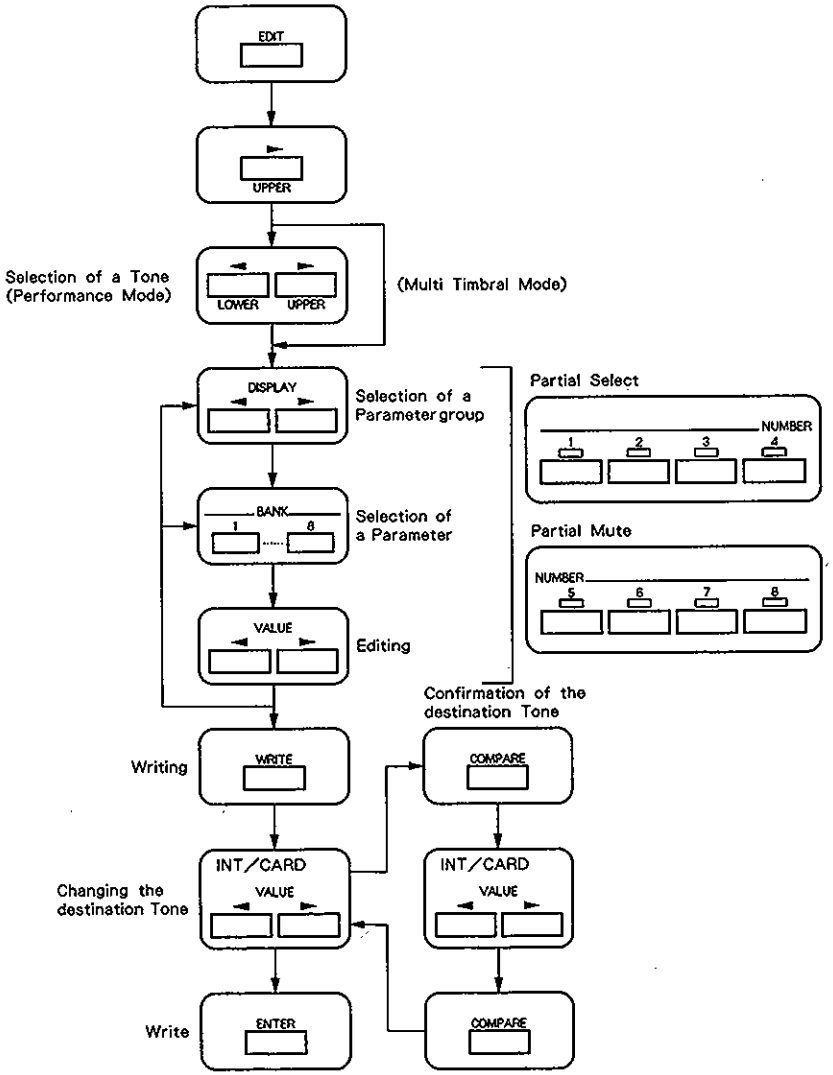
D-5 Quick Operation Table (1)

Roland

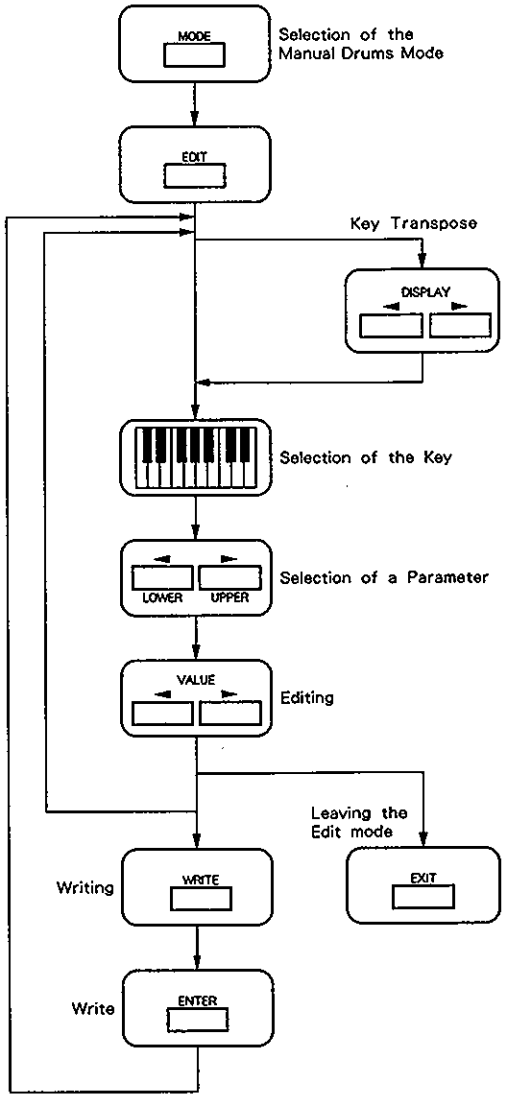
Editing Patch/Timbre



Editing Tone



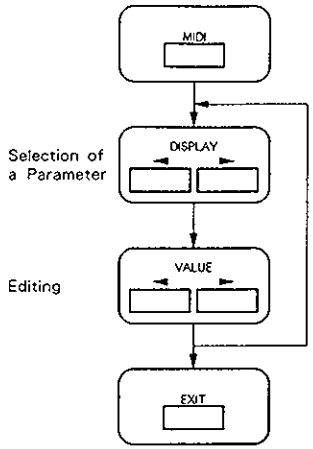
Setup of Rhythm



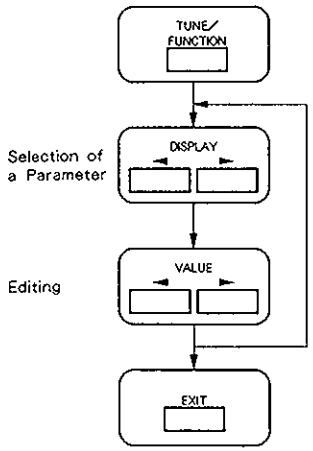
D-5 Quick Operation Table (2)

Roland

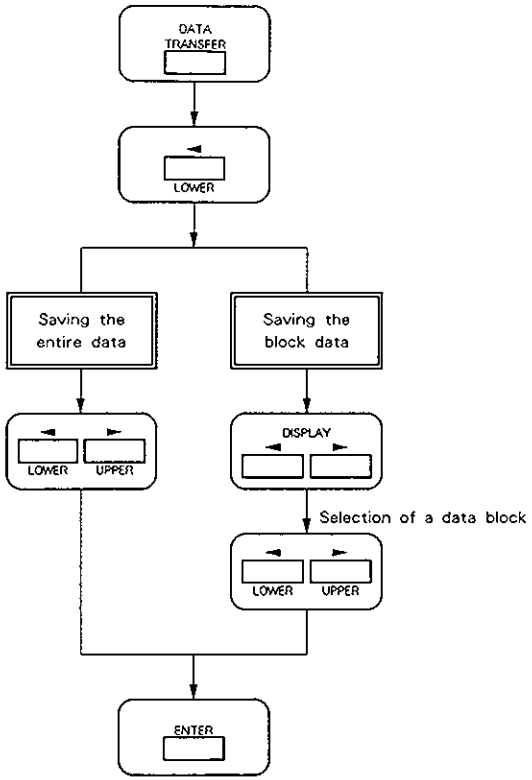
Editing MIDI Function



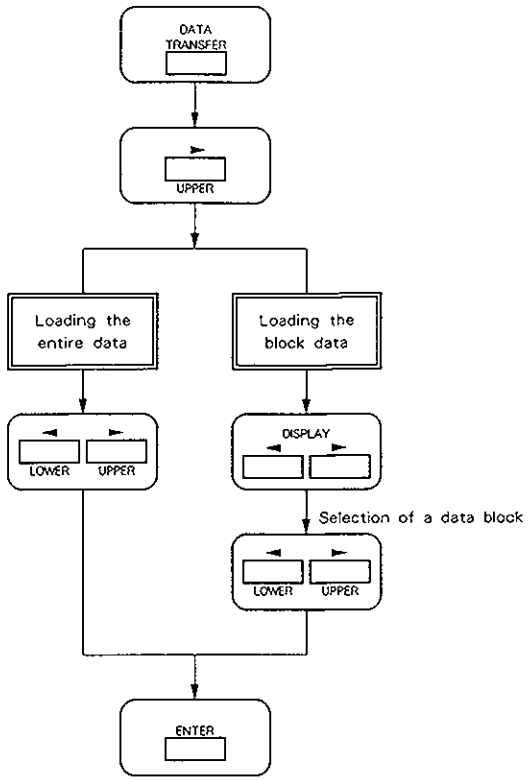
Editing Tune/Function



Saving onto a memory card



Loading from a memory card



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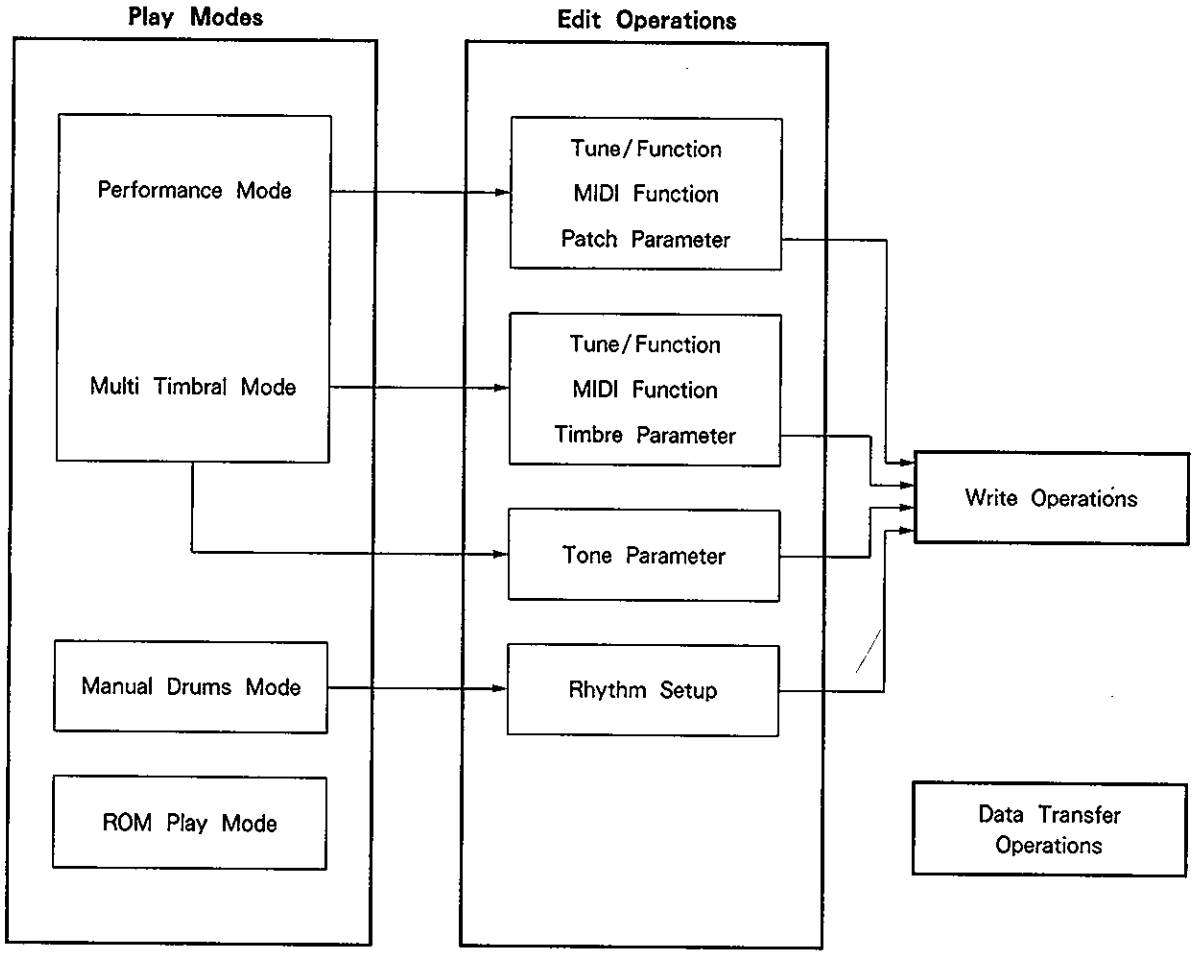
OVERALL ORGANIZATION OF THE D-5

1. Operation

D-5 operation is divided into four modes, selected using the **MODE**. Edit/Write/Data transfer operations are organized as follows.



■Play modes

In play mode, you can select one of the four playing modes.

● **Performance Mode**

This mode is used mainly when playing the D-5 from its keyboard. In Performance mode, you can switch sounds by selecting patches.

● **Multi Timbral Mode**

In Multi Timbral mode, the D-5 can function as eight independent synthesizers and a rhythm tone generator. This means that when used with a MIDI sequencer, a single D-5 can produce all the sounds of an entire ensemble. In Multi Timbral mode, you can switch sounds by selecting timbres.

● **Manual Drums Mode**

In Manual Drums mode, you can play percussion sounds from the keyboard.

● **ROM Play Mode**

In ROM Play mode, you can hear a demo performance that demonstrates the D-5's multi-timbral capabilities.

■Edit operations

These operations set or modify various parameters to create or modify sounds and determine how the sounds will be controlled.
Some edited settings are stored immediately, but settings for patch, timbre, rhythm setup, tone, etc. are temporary, and are not directly stored. After editing these parameters, remember to write them into memory if you want to keep the changes you made.

■Write operations

These operations store edited settings into the D-5's internal memory or into a memory card.
For Tune/Function and MIDI functions, the edited settings are stored directly into memory, so there is no need to write them. (Some of these settings are not memorized.)

■Data transfer operations

These operations copy (transfer) data between the D-5 and memory card, or between two D-5s. When using a newly-purchased memory card (RAM) for the first time, use the data transfer functions to temporarily store all internal data into the memory card.

2. About Patches/Timbres and Tones

This section will explain how D-5 sound data is organized.

a. Tones

The tones used by patches in Performance mode, by timbres in Multi Timbral mode, and by rhythm setups consist as follows.

Tones are organized in the following groups.

● **Internal**

a group (preset tones) :	64 tones (a01—a64)
b group (preset tones) :	64 tones (b01—b64)
i group (programmable tones) :	64 tones (i01—i64)
r group (preset tones) :	63 tones (r01—r63, OFF)

● **Memory Card**

c group : 64 tones (c01—c64)

Each tone is shared by patches, timbres, and rhythm setup. A rhythm setup can use tones from the internal r group or i group.

Settings can be edited for tones which are assigned to the currently selected patch or timbre. If you want to edit a tone which is currently not assigned to any patch/timbre, you will first have to select that tone in patch/timbre edit.

Edited tone settings can be stored in i group or in c group of the memory card (RAM). Internal groups a, b, and r contain basic D-5 tone settings, and cannot be rewritten.

b. Patches and tones

In Performance mode, patches and tones are made up as follows.

Patches are divided into two groups, A and B. Each group is organized as 8 banks with 8 numbers in each bank.
Internal memory can contain 128 patches, and a memory card can contain an additional 128 patches. D-5 panel operations can switch between these 256 patches.

● **Internal**
Sixty-four patches in bank A (11—18, 21—28, ····· 81—88)
Sixty-four patches in bank B (11—18, 21—28, ····· 81—88)

● **Memory Card**
Sixty-four patches in bank A (11—18, 21—28, ····· 81—88)
Sixty-four patches in bank B (11—18, 21—28, ····· 81—88)

A patch consists of a tone with settings for performance functions, but the patch itself does not contain tone data. This means that even if you select a different tone to be used in a patch, the settings of that tone are not lost.
However, if you edit the settings of a tone, all patches (or timbres) that use that tone will be affected.

Tones can be used by a patch as follows ;
- group "a", "b", and "r" preset tones can be used by either internal or memory card patches.
- group "i" programmable tones can be used only by internal patches.
- group "c" tones can be used only by memory card patches.

When storing patches from internal to memory card, or from memory card to internal, note the following points.
When a patch which uses group "i" tones is stored to memory card, the tones used by that patch will be changed to group "c". In this case, if group "i" contains a different set of tones than group "c", the patch will sound unexpectedly different. This also applies when storing from memory card to internal.
To avoid confusion, we recommend that you store identical sets of tones in both internal and memory card. If group "i" and group "c" contain different sets of tones, and the sound changes, you will need to write the tones into memory.

c. Timbres and tones

In Multi Timbral mode, timbres and tones are made up as follows.

Like patches, timbres are divided into two groups A and B. Each group is organized as 8 banks with 8 numbers in each bank.
Internal memory contains 128 timbres, and a memory card can contain an additional 128 timbres. D-5 panel operations can switch between these 256 timbres.

● Internal

Sixty-four timbres in bank A (11—18, 21—28, ····· 81—88)
Sixty-four timbres in bank B (11—18, 21—28, ····· 81—88)

● Memory Card

Sixty-four timbres in bank A (11—18, 21—28, ····· 81—88)
Sixty-four timbres in bank B (11—18, 21—28, ····· 81—88)

In Multi Timbral mode, timbres can be assigned to each part. Timbres can be independently selected and edited for each part.
A timbre consists of a tone with performance settings, but the timbre itself does not contain tone data. This means that even if you select a different tone to be used in a patch, the settings of that tone are not lost. However, if you edit the settings of a tone, all timbres (or patches) that use that tone will be affected.

Tones can be used in a timbre as follows ;

- Group a, b, and r preset tones can be used by either internal or memory card timbres.
- Group i programmable tones can be used only by internal timbres.
- Group c tones can be used only by memory card timbres.

When storing timbres from internal to memory card, or from memory card to internal, note the following points.
When a timbre which uses group i tones is stored to memory card, the tones used by that timbre will be changed to group c. In this case, if group i contains a different set of tones than group c, the timbre will sound unexpectedly different. This also applies when storing from memory card to internal.
To avoid confusion, we recommend that you store identical sets of tones in both internal and memory card. If group i and group c contain different sets of tones, and the sound changes, you will need to write the tones into memory.

MEMO

SECTION I

SYSTEM SETTINGS

Settings for Tune/Function and MIDI functions affect the entire D-5. These functions will set different parameters, depending on the currently selected play mode. In this section, we will explain all of the parameters which can be set in the various play modes.

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1 TUNE/FUNCTION

Tune/Function contains settings such as master tuning and memory protect, and in Multi Timbral mode, the level setting for each part.

The Tune/Function parameters that can be set in the various modes are as follows. Some parameters are shared between all play modes. When these parameters are modified, the setting will apply in all play modes.

*Except for the memory protect setting, all settings are remembered even when the power is turned off. When the power is turned on, memory protect will be on.

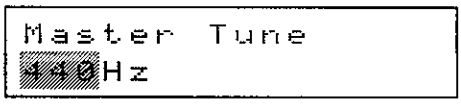
Performance Mode Parameter	Value	Multi Timbral Mode Parameter	
Master Tuning	428—453Hz	Master Tuning	(Common)
Memory Protect	ON, OFF	Memory Protect	(Common)
Rhythm Level	0—100	Rhythm Part Level	(Common)
	Pan : 7>—><—<7 Level : 0—100	Pan, Level (Part 1—8)	
	0—32	Partial Reserve (Part 1—8, Rhythm Part)	

1. Tune/Function functions

In this section we will be explaining the Tune/Function operations for all modes.

*Parameters that can be set in Performance mode will be indicated by PERFORMANCE. Parameters that can be set in Multi Timbral mode will be indicated by MULTI TIMBRAL.

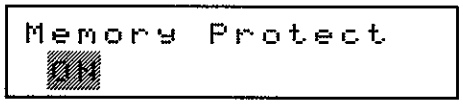
● Master Tuning (Value : 428—453Hz (the frequency of the A4 key))
Common to PERFORMANCE and MULTI TIMBRAL.



Use this to adjust the pitch of the D-5 to other instruments. The display will change in steps of 1Hz, but the actual pitch change is nearly continuous.

*Depending on the tone settings (type of PCM sound), there will be some cases in which master tuning does not affect the pitch.

● **Memory Protect (Value : ON, OFF)**
Common to PERFORMANCE and MULTI TIMBRAL.

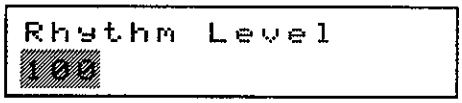


This prevents the data in D-5 memory from being accidentally erased. To protect your valuable data, leave this on except when writing data into memory.
Memory protect can be temporarily turned off when writing data into memory. However, when you need to successively perform many writing operations, for example when rearranging patches or timbres, it will be easier to temporarily turn memory protect off.

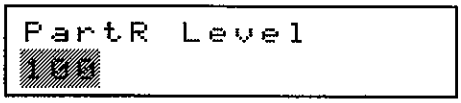
*When the power is turned on, memory protect will be on.

● **Rhythm Level/Rhythm Part Level (Value : 0—100)**
Common to PERFORMANCE and MULTI TIMBRAL.

< Performance Mode >



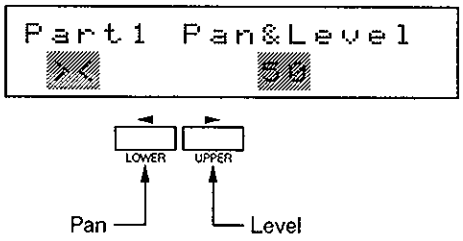
< Multi Timbral Mode >



This adjusts the overall volume of the various rhythm sounds.
In Performance mode, use this to adjust the volume balance between rhythm sounds and the patch.
In Multi Timbral mode, use this to adjust the volume balance between the rhythm part and the other parts.

● **Pan (Value : 7 >—><—>7) and Level (Value : 0—100)**

MULTI TIMBRAL



(The display is the same for parts 2—8)

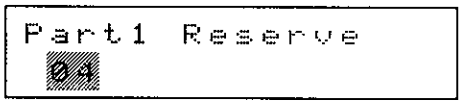
Set the pan and volume for each part 1—8. Pan (pan pot) determines the position of the sound in the stereo output. Use it with the level setting to set the output balance of each part.

To set pan, press **◄/LOWER** (the value being set will blink). Make settings over a range of 7 >—><—<7. >< puts the sound at the center, 7 > at the left, and < 7 at the right.
To set level, press **UPPER/►** (the value being set will blink). The sound will become louder as you increase the value.

*To set pan and level for each rhythm part, see page 40.
*Depending on the tone setting (structure), there will be cases when the pan setting value does not correspond to the actual stereo position.
*For tones created with one partial, the actual panning will be in 8 steps.

● **Partial Reserve (Value : 0—32)**

MULTI TIMBRAL



(The display is the same for parts 2—8 and part R.)

This sets the minimum number of partials reserved for each part when note data exceeding the maximum polyphony (32 partials) is received. It is not possible to make partial reserve settings where the total for all parts would exceed 32 partials.

*When the D-5 is shipped, partial reserve for each part is set as follows.
Part 1 = 04 Part 2 = 06 Part 3 = 04 Part 4 = 04
Part 5 = 04 Part 6 = 04 Part 7 = 00 Part 8 = 00
Part R = 06
*In Performance mode, the following partial reserve settings are fixed, and cannot be changed.
Upper = 12 Lower = 12 Rhythm = 08

2. Tune/Function Editing Operations

In this section we will explain Tune/Function editing operations.

From any play mode other than ROM play, perform the following steps. In Manual Drums mode, you can set the same parameters as in Multi Timbral mode.

1 **Press [TUNE/FUNCTION].**

2 **Press [DISPLAY] and select the parameter to set.**
Each time you press the button, the next parameter screen will be displayed.

3 **Use [◄]VALUE[►] to modify the number. (During input, the number will blink.)**

4 **When you have finished making settings, press [EXIT].**
You will return to the screen before you began editing.

2 MIDI FUNCTIONS

In this section, we will explain how MIDI channels and MIDI data are handled.

MIDI function parameters that can be set in the two play modes are as follows.
When parameters that are common to both play modes are set, the new setting will apply to the other mode as well.

*Settings other than local control and patch (timbre) dump are retained even when the power is turned off. Local control is always turned on when the power is turned on. Patch (timbre) dump is always turned off when the power is turned on.

Performance Mode Parameter	Value	Multi Timbral Mode Parameter	
Receive Channel	1—16		
Transmit Channel	1—16		
	1—16	Part Receive Channel (Parts 1—8)	
Rhythm Receive Channel	1—16	Rhythm Part Receive Channel	(Common)
Local Control	ON, OFF	Local Control	(Common)
Bender	ON, OFF		
Modulation	ON, OFF		
Volume (Receive)	ON, OFF		
Hold	ON, OFF		
Program Change	ON, OFF		
Expression	ON, OFF	Expression	(Common)
Breath	OFF, EXP, MOD, E & M	Breath	(Common)
Unit Number	17—32, OFF	Unit Number	(Common)
Patch Dump	ON, OFF	Timbre Dump	(Common)
	1—16	Keyboard Transmit Channel	

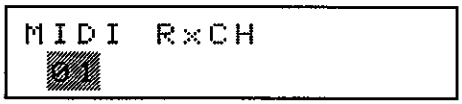
1. About MIDI Functions

This section explains what the MIDI functions do in each play mode.

*Parameters which can be set in Performance mode are indicated by PERFORMANCE, and parameters which can be set in Multi Timbral mode are indicated by MULTI TIMBRAL.

● Receive Channel (Value : 1—16)

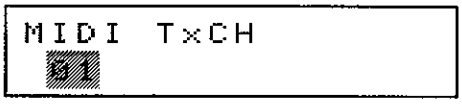
PERFORMANCE



This sets the receive channel used when controlling the D-5 from an external MIDI device.

● Transmit Channel (Value : 1—16)

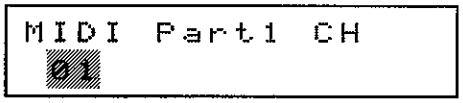
PERFORMANCE



This sets the transmit channel used when controlling an external MIDI device from the D-5. In Manual Drums mode, you can play rhythm sounds from the keyboard, and your playing will be transmitted on this transmit channel.

● Part Receive Channel (Value : 1—16)

MULTI TIMBRAL



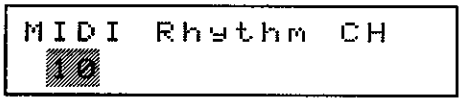
(The display is the same for parts 2—8.)

This sets the receive channel for each part.

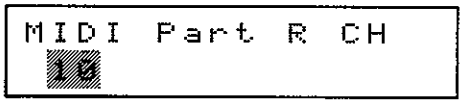
● Rhythm Receive Channel/Rhythm Part Receive Channel (Value : 1—16)

Common to PERFORMANCE and MULTI TIMBRAL.

< Performance Mode >

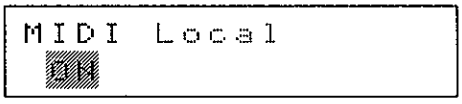


< Multi Timbral Mode >



In Performance mode, this sets the receive channel used when controlling the D-5's rhythm tone generator from an external MIDI device.
In Multi Timbral mode, this sets the receive channel for the rhythm part.

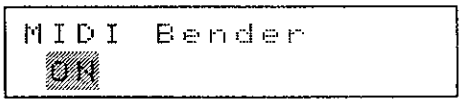
● **Local Control (Value : ON, OFF)**
Common to PERFORMANCE and MULTI TIMBRAL.



This turns local control ON/OFF.
Local control can separate the D-5's keyboard and panel from its tone generator. When set OFF, performance data from the keyboard will be transmitted from MIDI OUT, but will not sound the D-5's own tone generator. However, the D-5's tone generator will produce sound in response to data received at its MIDI IN.

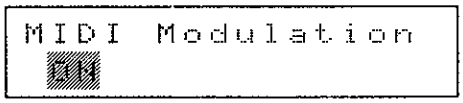
*When the power is turned on, local control will be ON.

● **Bender (Value : ON, OFF)**
PERFORMANCE



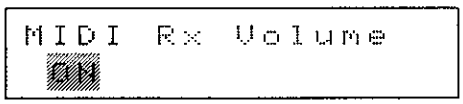
When you want pitch bender data to be transmitted and received, set this ON. If not, set this OFF. If you want to conserve sequencer memory by not recording bender data, set this OFF.

● **Modulation (Value : ON, OFF)**
PERFORMANCE



When you want modulation data such as vibrato to be transmitted and received, set this ON. If not, set this OFF. If you want to conserve sequencer memory by not recording modulation data, set this OFF.

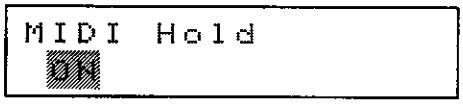
● **Volume (Value : ON, OFF)**
PERFORMANCE



When you want volume data to be received, set this ON. If not, set this OFF.

● **Hold (Value : ON, OFF)**

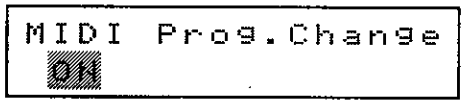
PERFORMANCE



When you want hold data to be received and transmitted, set this ON. If not, set this OFF.

● **Program Change (Value : ON, OFF)**

PERFORMANCE

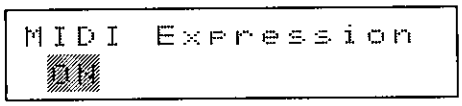


When you want program change data to be received and transmitted, set this ON. If not, set this OFF.
Program change numbers correspond to patches as follows. The same numbers apply to both internal and memory card.

	Bank \ Number	1	2	3	4	5	6	7	8
A Group	1	1	2	3	4	5	6	7	8
	2	9	10	11	12	13	14	15	16
	3	17	18	19	20	21	22	23	24
	4	25	26	27	28	29	30	31	32
	5	33	34	35	36	37	38	39	40
	6	41	42	43	44	45	46	47	48
	7	49	50	51	52	53	54	55	56
	8	57	58	59	60	61	62	63	64
B Group	1	65	66	67	68	69	70	71	72
	2	73	74	75	76	77	78	79	80
	3	81	82	83	84	85	86	88	88
	4	89	90	91	92	93	94	95	96
	5	97	98	99	100	101	102	103	104
	6	105	106	107	108	109	110	111	112
	7	113	114	115	116	117	118	119	120
	8	121	122	123	124	125	126	127	128

*MIDI program change messages are transmitted over a range of 0—127.
*It is not possible to switch between internal and memory card from an external MIDI device.
*In Multi Timbral mode, program change receive and transmit is always possible.

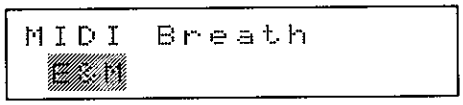
● **Expression (Value : ON, OFF)**
Common to PERFORMANCE and MULTI TIMBRAL.



When you want expression data to be received, set this ON. If not, set this OFF.

*Expression can be set independently for each play mode.

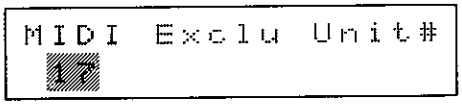
● **Breath (Value : OFF, EXP, MOD, E & M)**
Common to PERFORMANCE and MULTI TIMBRAL.



This determines how breath data is received. Set this when using a wind synthesizer or breath controller to control the D-5.

OFF ····· Breath control data will not be received.
EXP ····· Breath control data will control expression (volume).
MOD ····· Breath control data will control modulation (vibrato/tremolo).
E & M ····· Breath control data will control both expression and modulation.

● **Unit Number (Value : 17 — 32, OFF)**
Common to PERFORMANCE and MULTI TIMBRAL.

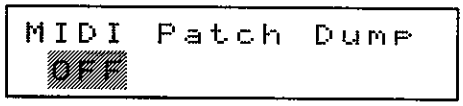


The unit number is the identification number used when transmitting and receiving exclusive messages regardless of the MIDI channel number (only those with a Roland ID number). When transmitting and receiving exclusive messages regardless of the MIDI channel, make sure that the unit numbers of the two MIDI units match. System exclusive data can be transferred only between units that are set to the same unit number. The range of settings is 17 — 32, or OFF. When set OFF, system exclusive messages will not be transmitted or received. When using a programmer (PG-10), set this to match the unit number of the programmer.

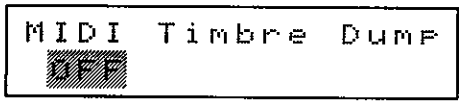
*Even when receiving and transmitting exclusive messages on the MIDI channel, set this to a setting of 17 — 32.
*When the power is turned on, the unit number will be set to 17.

● **Patch Dump/Timbre Dump (Value : ON, OFF)**
Common to PERFORMANCE and MULTI TIMBRAL.

< Patch Dump >



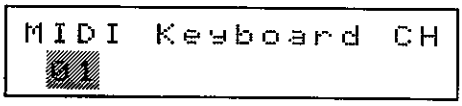
< Timbre Dump >



Patch/Timbre bulk dump allows you to transmit the sound data of the selected patch/timbre as an exclusive message. When you want to transmit the sound data of the selected patch/timbre, set this ON.
In either play mode, when you select a patch/timbre from the front panel, the corresponding sound data will be transmitted.
If you record sound data into a sequencer along with the musical data, the patches you recorded with will always be used, even if the patch/timbres of the D-5 have been edited.
Patch/Timbre dump transmits exclusive messages using the unit number.

*When the power is turned on, patch/timbre dump will be turned OFF.

● **Keyboard Transmit Channel (Value : 1—16)**
MULTI TIMBRAL



This sets the channel on which D-5 keyboard playing and panel operations will transmit control data.

2. MIDI Function Editing Procedure

This section explains the procedure for editing MIDI functions.

In any play mode other than ROM Play, perform the following operations. In Manual Drums mode, you will be able to make the same settings as in Multi Timbral mode.

1 **Press [MIDI].**

2 **Press [DISPLAY], and select the parameter to set.**
Each time you press the button, the screen for the next parameter will appear.

3 **Use [◄]VALUE[►] to modify the value. (While entering, the value will blink.)**

4 **When you have finished making settings, press [EXIT].**
You will return to the screen that was displayed before you began editing.

SECTION II

PATCH / TIMBRE SETTINGS

This section will explain the function of the patch/timbre parameters, and edit and write operations.

1 PATCH EDITING 24
1. Patch Parameter Functions 24
2. Patch Editing Procedure 31

2 TIMBRE EDIT 32
1. Timbre Parameter Functions 32
2. Timbre Editing Procedure 35

3 PATCH / TIMBRE WRITE PROCEDURE 37

1 PATCH EDITING

This explains the function of the patch parameters, and patch editing procedure.

1. Patch Parameter Functions

Patch parameters determine how a combination of two tones is played, and how the various patch effects are used.

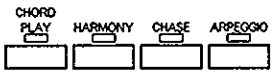
Patches have the following parameters.

Parameter	Value
Patch Effect Select	OFF, Chord Play, Harmony, Chase, Arpeggio
Key Mode	WHOLE, DUAL, SPLIT
Split Point	C2—C#7
Lower Tone Select	Tone Group : a, b, i(c), r Tone No. : 1—64
Upper Tone Select	Tone Group : a, b, i(c), r Tone No. : 1—64
Key Shift (☆)	−24—+24
Fine Tune (☆)	−50—+50
Bender Range (☆)	0—24
Assign Mode (☆)	1, 2, 3, 4
Effect Rate	0—100
Harmony Balance	−12—0
Chase Shift	−12—+12
Chase Level	0—100
Arpeggio Mode	UP, DOWN, U & D, RND
Tone Balance	0—100
Patch Level	0—100
Patch Name	(space) A—Z a—z 0—9 & # ! ? . , : ; ' " * + − / < = > (within 16 characters)

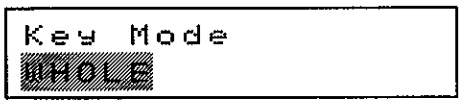
* (☆) indicates independent settings for upper/lower tones.

● Patch Effect Select (Value : OFF, Chord play, Harmony, Chase, Arpeggio)

This allows you to select which Patch effect (Chord play, Harmony, Chase, or Arpeggio) should turned on in each Patch. The Effect mode can be set using a Patch Effect button on the front panel.



● Key Mode (Value : WHOLE, DUAL, SPLIT)



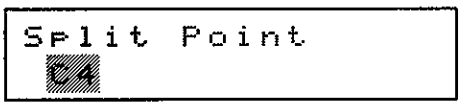
Select one of the following to determine how the two tones chosen by tone select will be sounded.

WHOLE :
Only the upper tone will sound. This is effective when you need alot of polyphony, as for piano sounds.

DUAL :
The upper and lower tones will be stacked. This is effective when creating thick sounds such as strings or organ.

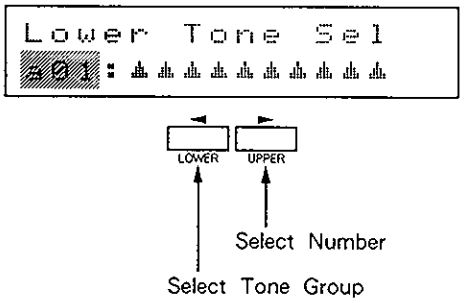
SPLIT :
Different tones will sound for each area of the keyboard divided by the split point. Notes below the split point will sound the lower tone, and notes above the split point will sound the upper tone.This is effective when you need to use two different sounds at once, such as bass and piano.

● Split Point (Value : C2—C#7 (semitone steps))



When key mode is set to split, this determines the point at which upper and lower tones will be divided.
When using patch effects such as chord play/harmony/arpeggio, this split point will divide the range. In such cases, the split point is effective even when the key mode is set to dual or whole.

● **Lower Tone Select (Value : a1 — a64, b1 — b64, i(c)1 — i(c)64, r1 — r63, OFF)**

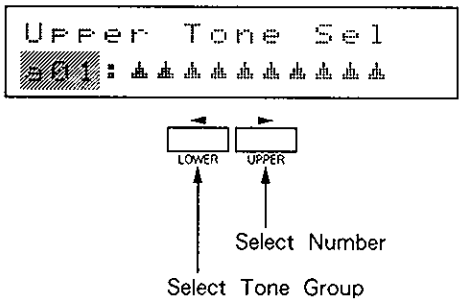


This selects the tone for the lower side.
Tones are arranged in groups. The selectable groups will be different for internal patches and memory card patches. When this is set OFF, there will be no sound.

	Internal Patches		Memory Card Patches	
Tone Group	a, b, i	r	a, b, c	r
Number	1 — 64	1 — 63, OFF	1 — 64	1 — 63, OFF

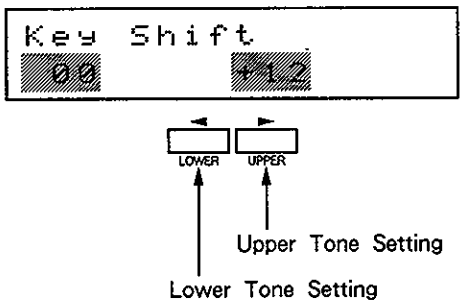
a : Preset Tones (Internal)
b : Preset Tones (Internal)
r : Preset Rhythm Tones (Internal)
i : Programmable Tones (Internal)
c : Memory Card Tones (Memory Card)

● **Upper Tone Select (Value : a1 — a64, b1 — b64, i(c)1 — i(c)64, r1 — r63, OFF)**



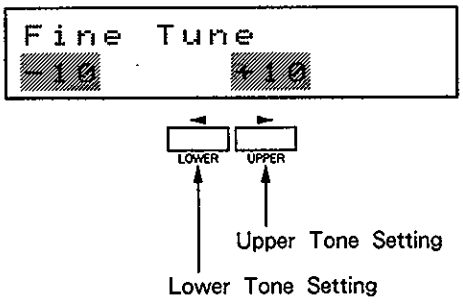
This selects the tone for the upper side.
Tones are arranged in groups. The selectable groups will be different for internal patches and memory card patches. (See the explanation for lower tone select.) When this is set OFF, there will be no sound.

● **Key Shift (Value : −24 — +24 (semitone stpes))**



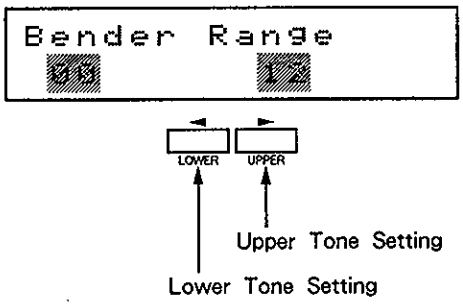
This shifts the pitch produced by each tone in semitone steps. Negative (−) settings will lower the pitch, and positive (+) settings will raise the pitch.

● **Fine Tune (Value : −50 — +50 (approximately ±50 cents))**



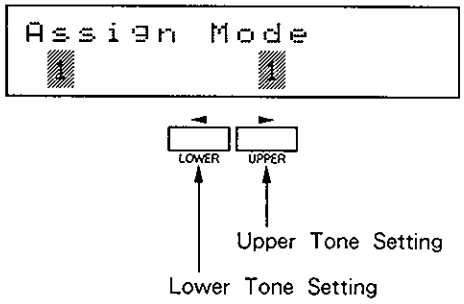
This is a fine adjustment for the pitch produced by each tone. Negative (−) settings will lower the pitch, and positive (+) settings will raise the pitch.

● **Bender Range (Value : 0 — 24 (semitone stpes))**



This determines the range of pitch change when using the bender lever to control the pitch. The value set here is the amount of pitch change from normal (bender lever at the center) for fully left/right positions of the bender lever.

● Assign Mode (Value : 1—4)



From the following four, select how key data (note data) will sound the tones.

1 : single assign, last-note priority
2 : single assign, first-note priority
3 : multi assign, last-note priority
4 : multi assign, first-note priority

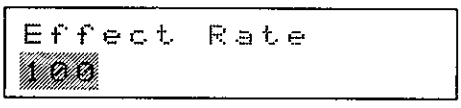
Single assign :
When note data overlaps the same key number (for a sound which sustains after the key is released, if the same key has been pressed before the sound disappears), the sound for that key will be turned off, and then re-sounded.

Multi assign :
When note data overlaps the same key number, the new sound for that key will be added to the previous sound.

Last-note priority :
If the number of simultaneously sounding partials exceeds 32, key data arriving later will be given priority, and currently sounding notes will be turned off.

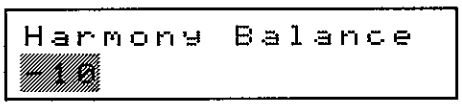
First-note priority :
If the number of simultaneously sounding partials exceeds 32, currently sounding notes will be given priority, and notes arriving later will be ignored.

● Effect Rate (Value : 0—100)



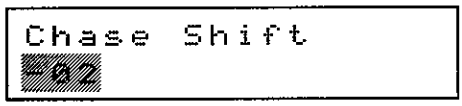
This adjusts the speed of change for the chase and arpeggio functions. Higher settings will result in faster change.

● **Harmony Balance (Value : −12—0)**



This adjusts the volume balance of the top note (the sound of the key pressed in upper) and the harmony sound. Lower values will decrease the volume of the harmony sound.

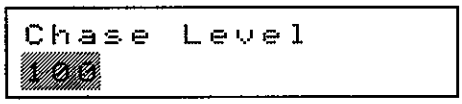
● **Chase Shift (Value : −12—+12 (semitone steps))**



This sets the pitch change of the chase sound (repeated sound) in the chase function.
Negative settings (−) will make the pitch of the chase sound gradually become lower, and positive settings (+) will make the pitch gradually become higher. With a setting of 0, the pitch will not change.

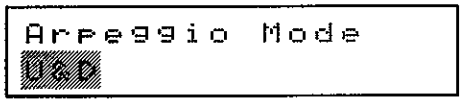
*Notes exceeding the limit (C1—C9) will not be sounded.

● **Chase Level (Value : 0—100)**



This determines how the chase sound (repeated sound) in the chase function will diminish.
Lower values will make the sound diminish more rapidly, and higher values will make the sound diminish more slowly.

● **Arpeggio Mode (Value : UP, DOWN, U & D, RND)**



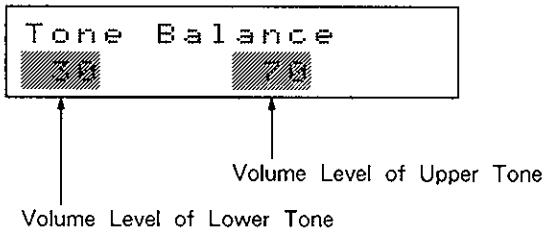
Select one of the following four types of pattern for the arpeggio function.

UP :
Repeatedly sound the notes of the chord in order from lowest to highest.

DOWN :
Repeatedly sound the notes of the chord in order from highest to lowest.

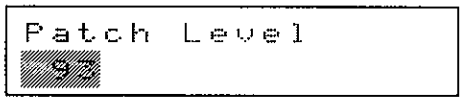
U & D (Up & Down) :
Repeatedly sound the notes of the chord from low to high to low.
RND (Random) :
Randomly (in an irregular pattern) sound the notes of the chord.

● Tone Balance (Value : 0—100)



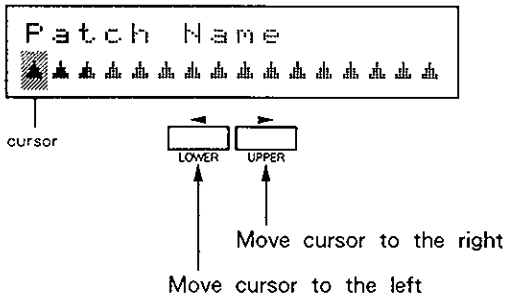
This adjusts the volume balance of upper and lower tones.
The total volume of upper and lower is 100, and increasing one value will automatically diminish the other value.

● Patch Level (Value : 0—100)



This adjusts the overall level of the entire patch. Use this to adjust the volume of a patch to match it with the volumes of other patches, to avoid a sudden or undesired volume change when switching patches.

● Patch Name (Value : (space) A—Z a—z 0—9 & # ! ? . , : ; ' " * + − / < = >)



Each patch can be given a 16-character name.
Use [◄/LOWER] [UPPER/►] to move the cursor to the character you want to change, and use [◄]VALUE[►] to select a character.

2. Patch Editing Procedure

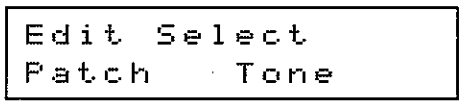
This explains the procedure for editing a patch.

*Edited settings are temporary, and when you turn the power off, or select a patch or play mode, they will return to the previous settings. To store your edited settings, remember to write them into memory (see page 37).

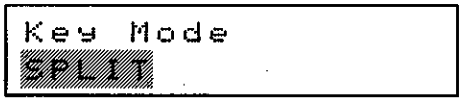
Before we begin the procedure, make sure that you are in Performance mode (the **PERFORMANCE** indicator is lit).

1 **Select the patch you want to edit.**

2 **Press [EDIT].**



3 **Press [◄/LOWER] to select Patch.**



4 **Use [◄]DISPLAY[►] to select the parameter to edit.**
When editing the Key shift, Fine tune, Bender range and Assign mode parameters, press [◄/LOWER] [UPPER/►] to select whether to edit the upper or lower tone. The value on the selected side will blink, and can be edited.

5 **Use [◄]VALUE[►] to modify the parameter value.**
*While editing, you can press [COMPARE] to hear how the patch sounded before you began editing (At this time, the upper right of the display will show a * mark). Press [COMPARE] again to resume editing.

6 **Repeat steps 4—5 to edit other parameters as desired.**
*If while editing, you decide to quit, press [EXIT] to return to play mode.

7 **If you want to store the newly edited settings, you will have to write them into memory as explained in Patch/Timbre write procedure (see page 37).**

2 TIMBRE EDIT

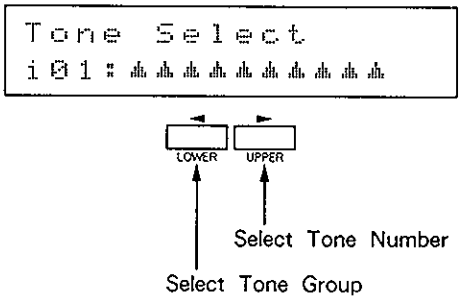
This section explains the function of the timbre parameters, and timbre editing procedure.

1. Timbre Parameter Functions

Timbre parameters determine how a single tone is sounded. A timbre includes the following parameters.

Parameter	Value
Tone Select	Tone Group : a, b, i(c), r Tone No. : 1—64
Key Shift	−24—+24
Fine Tune	−50—+50
Bender Range	0—24
Assign Mode	1, 2, 3, 4

● **Tone Select (Value : a1—a64, b1—b64, i(c)1—i(c)64, r1—r63, OFF)**

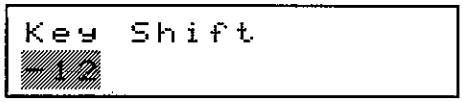


This selects the tone assigned to the timbre.
Tones are arranged in groups. Selectable groups will differ, depending on whether internal timbres or memory card timbres are being used. When set to OFF, there will be no sound.

	Internal Timbre		Memory Card Timbre	
Tone Group	a, b, i	r	a, b, c	r
Number	1—64	1—63, OFF	1—64	1—63, OFF

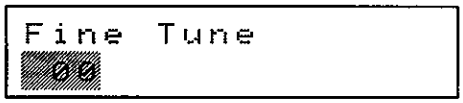
a : Preset Tones (Internal)
b : Preset Tones (Internal)
r : Preset Rhythm Tones (Internal)
i : Programmable Tones (Internal)
c : Memory Card Tones (Memory Card)

● **Key Shift (Value : −24 — +24 (semitone steps))**



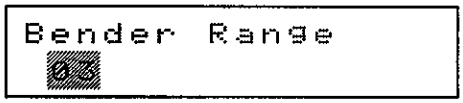
This adjusts the pitch of the tone in semitone steps.

● **Fine Tune (Value : −50 — +50 (approximately ±50 cents))**



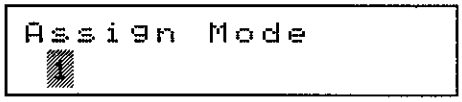
This is a fine adjustment for the pitch of the tone.

● **Bender Range (Value : 0 — 24 (semitone steps))**



This determines the range of pitch change when using the bender lever to control the pitch. The value set here is the amount of pitch change from normal (bender lever at the center) for fully left/right positions of the bender lever.

● **Assign Mode (Value : 1 — 4)**



From the following four, select how key data (note data) will sound the tones.

1 : single assign, last-note priority
2 : single assign, first-note priority
3 : multi assign, last-note priority
4 : multi assign, first-note priority

Single assign :
When note data overlaps the same key number (for a sound which sustains after the key is released, if the same key has been pressed before the sound disappears), the sound for that key will be turned off, and then re-sounded.

Multi assign :
When note data overlaps the same key number, the new sound for that key will be added to the previous sound.

Last-note priority :

If the number of simultaneously sounding partials exceeds 32, key data arriving later will be given priority, and currently sounding notes will be turned off.

First-note priority :

If the number of simultaneously sounding partials exceeds 32, currently sounding notes will be given priority, and notes arriving later will be ignored.

2. Timbre Editing Procedure

This explains the procedure for timbre editing.

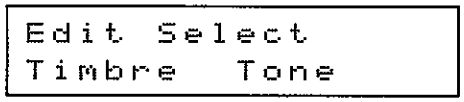
*Edited settings are temporary, and when you turn the power off, or return to play mode and select a timbre or play mode, your edits will be replaced by the previous settings. To store your edited settings, remember to write them into memory (see page 37).

Before we begin the procedure, make sure that you are in Multi Timbral mode (the **MULTI TIMBRAL** indicator is lit).

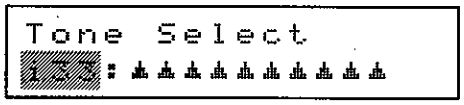
1 **Get the keyboard display.**
Unless you select a part which can be played from the keyboard, you will not be able to hear the sound as you edit.

2 **Select a timbre to edit.**

3 **Press [EDIT].**



4 **Press [◄/LOWER] to select Timbre.**



5 **Use [◄]DISPLAY[►] to select the parameter to edit.**

6 **Use [◄]VALUE[►] to modify the parameter value.**

*While editing, you can press [COMPARE] to hear how the timbre sounded before you began editing (At this time, the upper right of the display will show a * mark). Press [COMPARE] again to resume editing.

7 **Repeat steps 5—6 to edit other parameters as desired.**

*If while editing, you decide to quit, press [EXIT] to return to play mode.

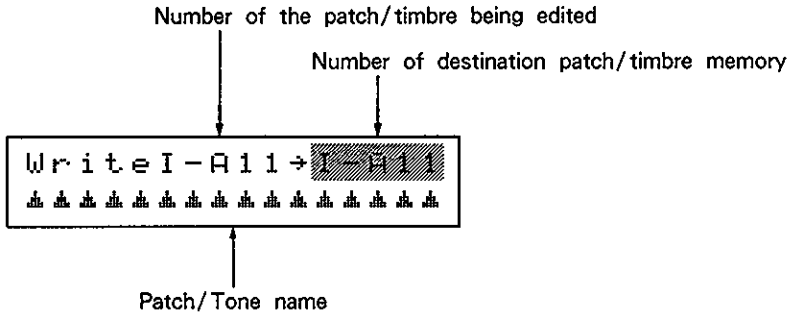
8 If you want to store the newly edited settings, you will have to write them into memory as explained in the following section 3 Patch/Timbre write procedure.

3 PATCH/TIMBRE WRITE PROCEDURE

This section explains how to write patches or timbres into memory.

A patch can be written into memory either during patch editing, or in Performance play mode.
A timbre can be written into memory either during timbre editing (in any timbre parameter display), or in Multi Timbral play mode. If you write while in play mode, the currently displayed timbre will be written into memory.

1 Press [WRITE] to get the writing display as follows.



2 If you have been editing a memory card patch/timbre, press [INT/CARD] to switch the destination to "i" (internal).

*If you write a patch/timbre into internal memory with c group selected, it will change to an i group tone. If the i group and c groups contain different tones, the sound will be unexpectedly different.
To avoid such accidents, we recommend that you keep the same tones in both internal and memory card. If internal and memory card contain different tones, and there is an unexpected change in the sound you have just written, you will also need to write the tones into memory (see page 83).

3 **Select the writing destination of the edited patch/timbre by pressing A/B, BANK 1—8, and NUMBER 1—8. If you are storing the patch/timbre in its original location, there is no need for this step.**

If you want to hear the sound of the patch/timbre in the writing destination to check whether it is alright to overwrite it, use the following procedure.

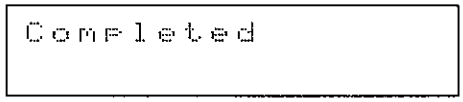
①Press COMPARE.

When you press **COMPARE**, you will be able to hear the sound of the selected patch/timbre (when you play the keyboard, the selected patch/timbre will sound). You can also select other patch/timbres and hear how they sound.

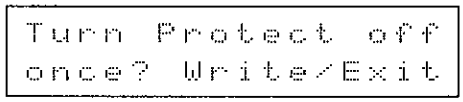
②Press COMPARE once again to return to the writing display.

4 **Press ENTER.**

○If memory protect is off (in the PLAY volume page 99), the following display will appear for a short time after writing is successfully executed, and you will then return to play mode.



○If memory protect is on, the following display will appear.



To temporarily turn memory protect off and write, press **WRITE**, and then press **ENTER** once again.

*By pressing **EXIT** during the write procedure, you can return to the patch/timbre number display. If you want to continue the write procedure, press **WRITE** again. If you select another patch/timbre without pressing **WRITE**, your edited settings will be lost.

*If writing was not successful, you will get an error message. Page 144 has a list of error messages, and the appropriate response for each.

SECTION Ⅲ

RHYTHM SETUP

This section explains how to modify the assignments of key numbers and rhythm sounds, and how to play the rhythm sounds. These settings let you adjust the D-5 rhythm sounds be triggered by rhythm data recorded in a MIDI sequencer, or adjust the balance of the rhythm sounds.

1. Rhythm Edit Operations 40
2. Rhythm Writing Procedure 42

1. Rhythm Edit Operations

This section explains how to edit the rhythm setup.

■ Parameters functions

Tones can be assigned to each key number C1 — C8 as rhythm sounds. In addition to the tone assignment for each key number, the following parameters can also be set.

● Tone Select (Value : r1 — r63, OFF, i1 — i64)

This assigns a rhythm tone to a key. In addition to the preset rhythm tones (r1 — r63), you can select from your own original internal tones (i1 — i64). When OFF is selected, there will be no sound.

*When internal tones are selected, the pitch will change depending on the key number to which it is assigned.

● Level (Value : 0 — 100)

This adjusts the volume of the tone. Higher settings will result in a louder volume.

● Pan (Value : 7 > — > < — < 7)

This determines the position of the sound when stereo output is used. >< is center, <7 is right, and 7> is left.

*Depending on the tone settings (structure), the pan setting and the actual position may differ.
*For tones created using one partial, the actual panning will be in 8 steps.

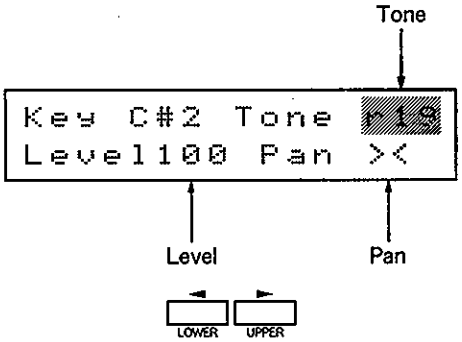
■ Editing procedure

Before you begin editing, check to make sure that you are in Manual Drums mode (the **MANUAL DRUMS** indicator is lit), and use the following procedure.

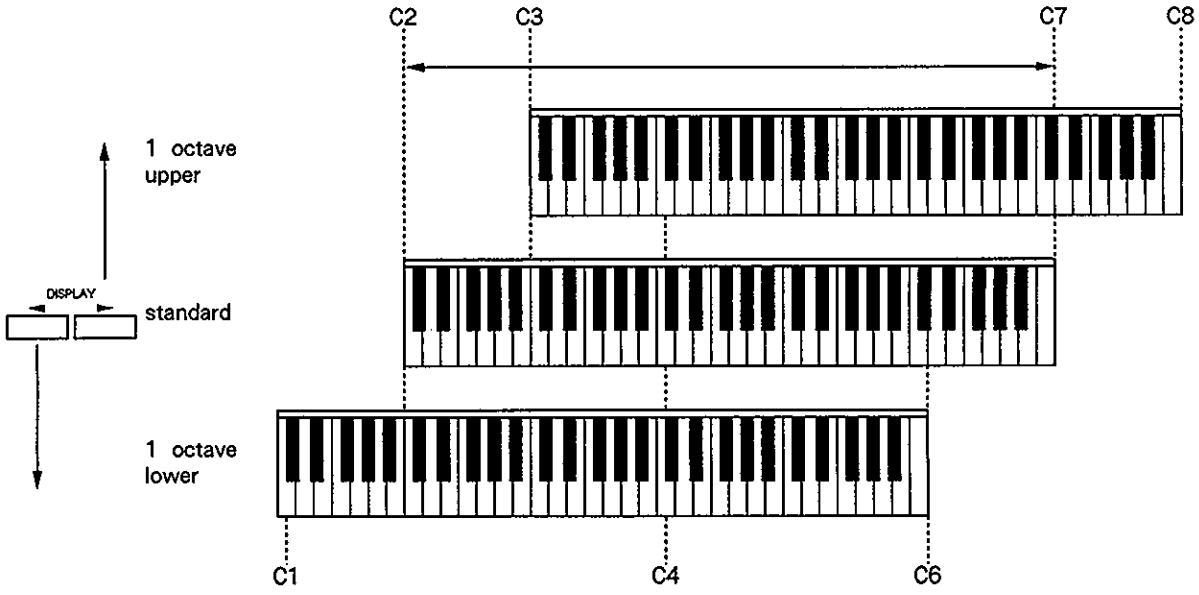
*Edited settings are temporary, and will return to the original settings when the power is turned on. If you want to keep your edited settings, use the writing procedure (page 42) for each key number.

1 **Press** [EDIT].
At this time, pressing a key will sound its rhythm tone.

2 **Press the key to edit.**
The tone, level, and pan settings for that key will be displayed.



To select a key outside the keyboard range (C1 — B1, C#7 — C8), press ◄DISPLAY► to move the key range, and then press a key. The **KEY TRANSPOSE** indicator will light.



3 **Press ◄/LOWER UPPER/► to select the parameter to edit.**
The value of the selected item will blink.

4 **Use ◄VALUE► to modify the setting.**

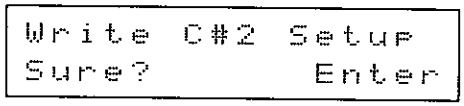
5 **If you want to keep the edited value, use the write procedure (explained immediately following).**
If you want to quit editing without keeping the edited value, press EXIT to return to the previous Manual Drums mode display.

2. Rhythm Writing Procedure

Edited rhythm settings must be written into memory for each key.

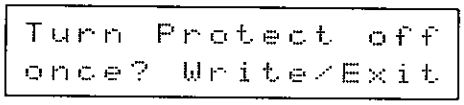
From rhythm editing, perform the following procedure.

1 **Press [WRITE].**



2 **Press [ENTER].**

If memory protect is on, the following display will appear.
If memory protect is off, the settings will be written into memory, and you will return to the editing display.



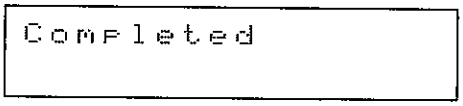
*To exit without writing, press [EXIT] to return to the previous editing display.

3 **Press [WRITE].**

Memory protect will temporarily be turned off, the you will return to the display of [1].

4 **Press [ENTER] once more.**

If write is successfully executed, the following display will appear, and then you will be returned to the rhythm editing display.



SECTION IV

TONE SETTINGS

In this section, we will explain the procedure for tone editing and basic concepts of the LA synthesis used in the D-5, and give actual examples and ideas for creating sounds. By following these guidelines, you will learn to create your own sounds.

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1 HOW A TONE IS CONSTRUCTED

Synthesizers in the D series, including the D-5, can be used to create sound in a similar way as conventional analog synthesizers. However the D series are not simply "digitalized" analog synthesizers ... they can create new types of sound that were very difficult to achieve with conventional analog synthesizers. This section will explain the basic concepts of LA synthesis, starting with basic ideas about sound, and then explaining the various tone parameters.

1. About Sound

We will be explaining LA synthesis by way of some basic concepts of sound.

a. Natural sound and LA synthesis

Acoustic instruments such as piano and violin are sounds similar to the complex sounds found in nature, such as the wind.

Think of the sound of the wind. We often consider this as a swooshing or howling sound, but detailed analysis shows that this includes many different sounds. The sound of the wind sweeping between buildings, the sound of leaves swept by the wind, the sound of the rain, ... Wind actually includes many sounds.
Now let's think of the sound of a piano. This includes the sound of the hammer striking the string, the sound of the vibrating string, and the sound of the other strings sympathetically vibrating. Restricting our attention to the vibration of the string, we can see that this includes a strong attack when the hammer strikes the string, a sustained sound that briefly decays, and a long decaying sound that eventually decays to silence. This too, is composed of many elements.

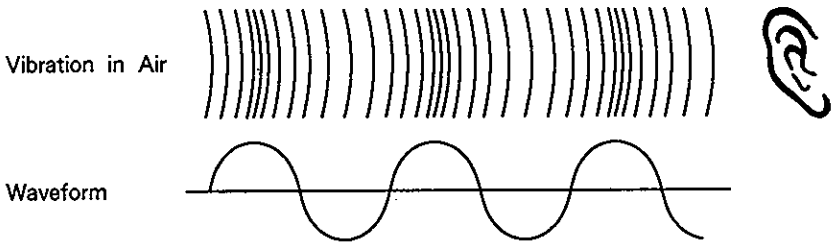
LA synthesis is based on the concept that a sound consists of a large number of sounds. In LA synthesis, sounds of completely different character can be created (partials), and combined to make a single sound.
Each partial creates sound using the principles of analog synthesis. And we can use PCM sounds to efficiently create sounds that would be difficult to create using analog synthesis techniques.

*LA is an abbreviation of Linear Arithmetic Synthesis. LA synthesis uses advanced digital technology, but allows you to create sounds using the accumulated know - how of conventional analog synthesizers.

b. Three elements of sound

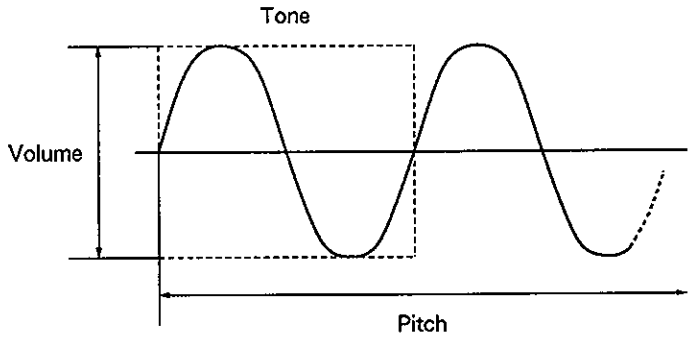
Here we will explain about the three elements that make up a sound.

In our daily lives, we are constantly in contact with various sounds. These sounds reach our ears as vibrations in the air. By expressing this vibration as an electrical signal, we can view it as a "waveform".



This waveform is determined by the three elements of pitch, tone, and volume. In addition to this, the way in which these elements change over time is also very important.

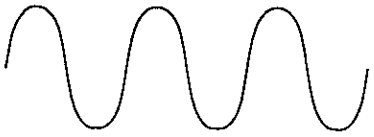
The character of a sound is determined by these three elements. For example, a tuba has a low pitch, a piccolo has a high pitch, brass instruments have bright sounds with many overtones, woodwinds have soft sounds with few overtones, organ sounds continue as long as a key is pressed, snare drums have a sharp percussive sound, etc.



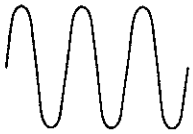
● **Pitch**

Pitch is determined by the speed of repetition (frequency) of the waveform. As the frequency increases, the pitch will rise. In general, pitch is expressed as frequency (the number of cycles per second), and shown in units of Hz (hertz).

In the D-5, the WG (page 54) determines the pitch.



Low Sound



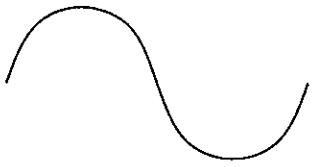
High Sound

● **Tone**

Tone is determined by the shape of the waveform (the overtone structure). In general, more rounded waveforms have a softer sound, and more irregular waveforms have a brighter, harder sound.

For details of waveform shape and overtone structure, see the following section "Overtones determine the tone".

In the D-5, this is determined by the TVF (page 54).



Soft Sound

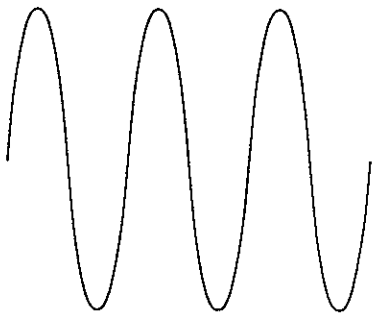
Bright Sound

● **Volume**

Volume is determined by the height (amplitude) of the waveform. As the waveform increases in height, the volume becomes louder.

In the D-5, this is determined by the TVA (page 54).

Small Sound

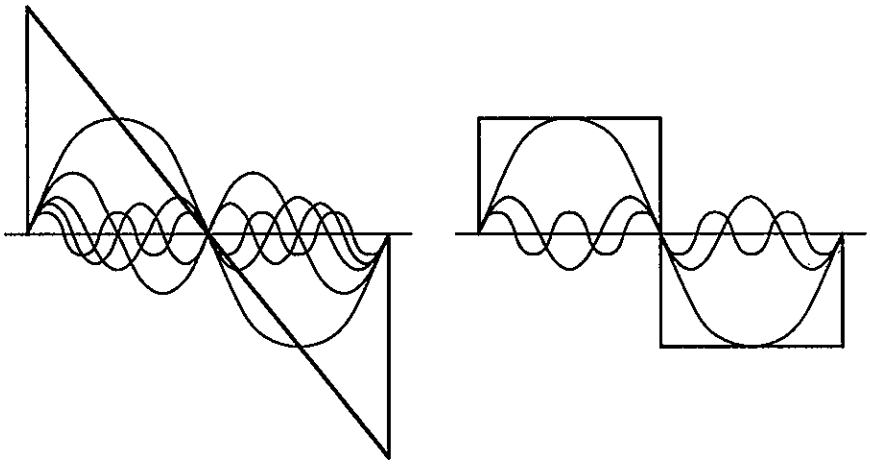


Loud Sound

c. Overtones determine the tone

We have already explained that tone is the "shape of the waveform". Here we will explain how that shape is determined.

It is possible to think of any sound as being a combination of various sine waves. For example, if we take a sine wave as the fundamental, and continue adding sine waves of frequencies that are multiples of the fundamental, we get a "sawtooth wave (SAW)". If we add sine waves of frequencies that are odd multiples of the fundamental, we get a "square wave (SQU)".



Sawtooth Wave　　Square Wave

The various sine waves added to the fundamental (the sine wave whose frequency determines the pitch of the sound) are known as "overtones". Overtones at integer multiples of the fundamental are called "harmonic" overtones, and other overtones are called "non-harmonic" overtones.
In general, string sounds such as violin and brass sounds such as trumpet are similar to sawtooth waves, and wind instruments such as flute and clarinet are similar to square waves. The D-5 uses sawtooth waves and square waves as basic waveforms, and uses the cutoff frequency of the TVF (Time Variant Filter, page 67) to adjust the overtone structure in order to create various sounds. In general, the more high frequency waves (high overtones) included in a sound, the brighter it will be.

In this way, tone is determined by the type and strength of the overtones.

*The ring modulator in the D-5's structure setting (page 52) can be used to modify the overtone structure.

d. The envelope creates natural change

The "envelope" is the change in a sound over time.

For every instrument, there is a characteristic way in which the three elements of sound change as time passes. This change in the sound over time is called the envelope. Every instrument has its own, unique envelope. Sounds that have the same basic tone but different envelopes can often be dramatically different.

● Pitch envelope

In some instruments (for example, brass), pitch is controlled by human lip pressure, and thus there is always a bit of pitch uncertainty at the beginning of a note. For example, if the beginning of a note is a bit low, the musician will raise the pitch. If he over-corrects, he will bring the pitch back down again. This change takes place in a moment, but results in a unique movement that gives the instrument its character.

The pitch envelope can be used to simulate this type of change.

The pitch envelope can simulate not only subtle changes, but also drastic changes such as for electronic drums that have a quick pitch sweep, or the gradually rising whine of a jet airplane taking off.

● Tone envelope (TVF envelope)

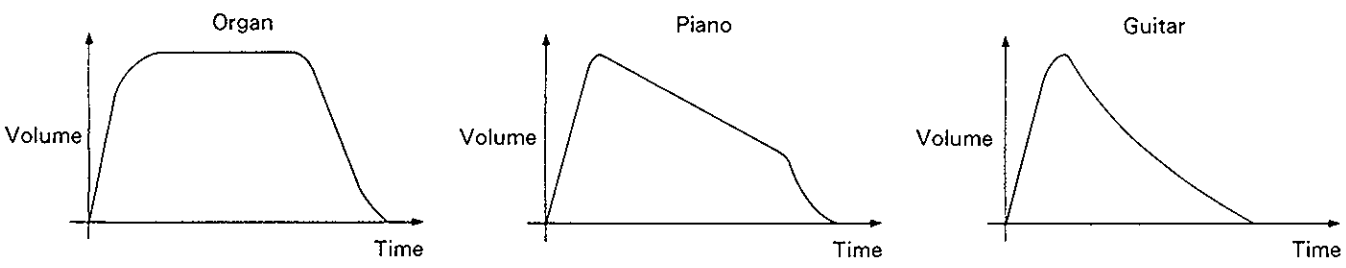
For most natural instruments, the beginning of the sound contains the most overtones, and as the sound decays, the overtones decrease. This decay is different for each instrument, and by making the overtones decay in an appropriate way, it is possible to simulate a specific instrument. In addition to simulating natural instruments, it is possible to create overtone changes that would not be found in natural instruments.

● Volume envelope (TVA envelope)

Sounds such as a piano begin at nearly the same instant as the key is pressed, and gradually decay in volume as long as the key is pressed. On the other hand, sounds such as organ continue sounding at a certain volume as long as the key is pressed.

In this way, volume change over time is an important factor in determining the character of a sound.

Various Volume Envelopes



2. Partials and Structures

A tone consists of four "partials" (the basic units of tone generation) and "common" parameters which determine how the partials are combined to work together. The most important factor in a tone is the common "structure". This section will explain how the "structure" and "partials" are related.

Each partial can independently produce its own sound. A tone consists of the combined sound produced by the partials, and the "structure" determines how the sounds of the partials are combined. Each tone has two structures, and each structure determines how two of the partials are used.

When modifying an already created tone, all you need to do is edit the parameters according to the structure setting. However when creating a sound from scratch, you will first need to decide which structure you want to use. If you change the structure while editing a partial, the configuration of the partial will change, which may produce unexpected results.

a. What the structure does

The structure determines how partials are used and combined. You can select from 13 different types of structure. The procedure is as follows.

①Select the type of tone generator to use for each partial.

Select whether each partial will function as a synthesizer sound generator or as a PCM sound generator.

Synthesizer sound generator :

A synthesizer sound generator creates sound in the same way as a conventional analog synthesizer.

PCM sound generator :

A PCM sound generator uses a PCM recording to create sound. A variety of PCM sounds are provided. They can be used as instrument attacks, as complete sounds in themselves, or as sound effects.

②Decide how the partials will be combined.

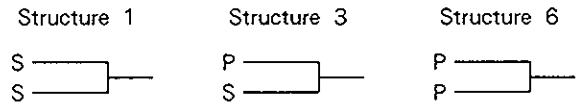
The 13 structures (combinations of partials) can be divided into those that use the ring modulator and those that do not.

b. Types of structure

Structures can be classified as follows, and used in various ways as explained.

■ Structures not using the ring modulator

● Structures 1, 3, 6 Structures which output the combined signals of two partials.



These are basic structures which can be used in a variety of ways.

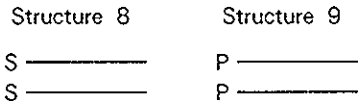
(1) Create the same sound with each partial, and slightly detune the pitch to make a thick sound. Or, it is often effective to tune partials an octave or fifth apart. This is also effective when creating string or organ sounds.

(2) When simulating acoustic sounds, it is often effective to use a PCM sound for the attack. For example, when simulating a brass instrument, the breath sound can be created using a PCM sound, and the sustained sound can be created using a looped PCM sound or a synthesizer sound.

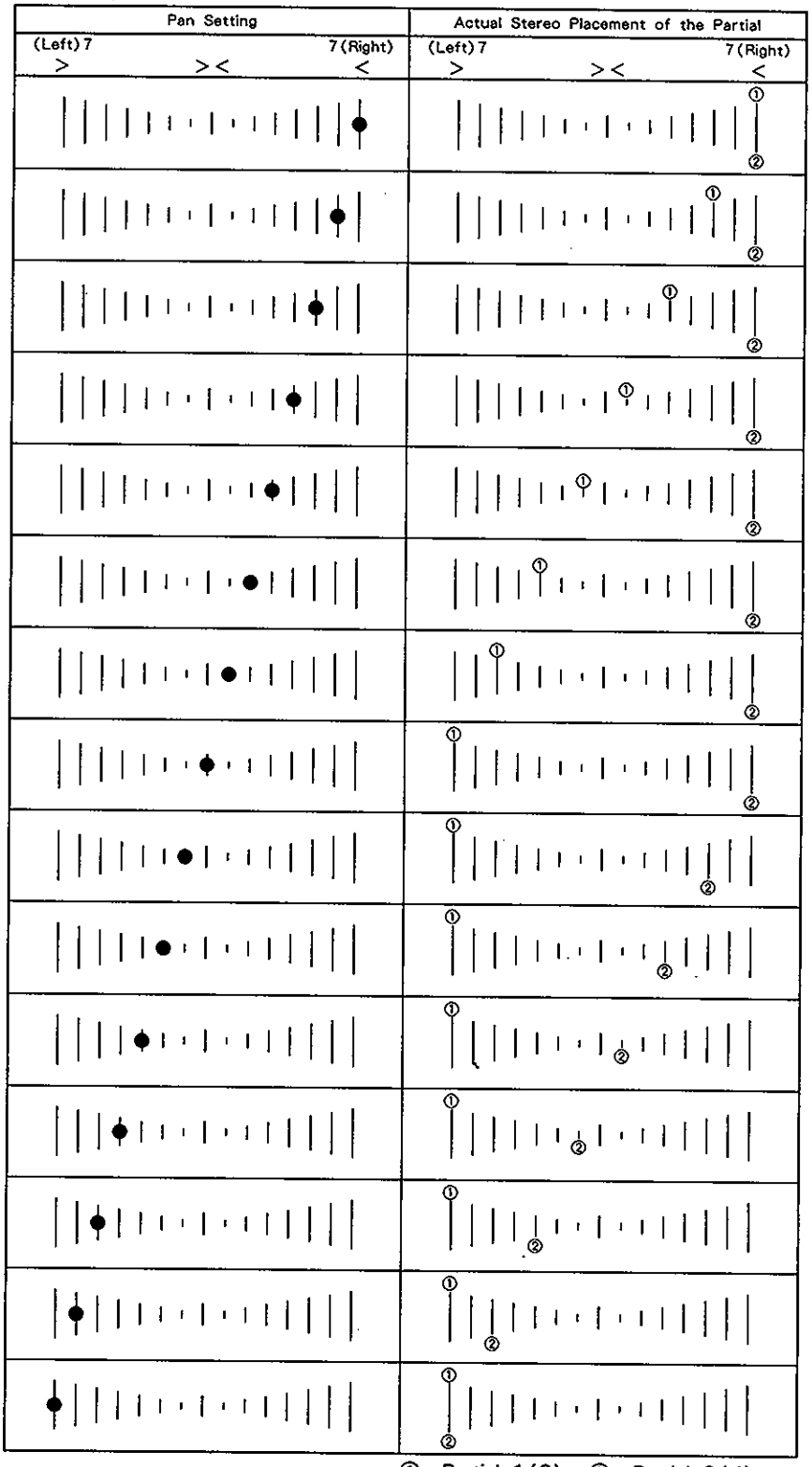
(3) Use separate partials to create bright sounds and soft sounds, and reverse the polarity of the TVA velocity so that key velocity will affect the tone.

(4) Use separate partials to create the low range and high range, and reverse the TVA bias settings so that the sound will change depending on the keyboard area you play.

● Structures 8, 9 These can be used in the same ways as structures 1 and 6, and are used when you want to create a stereo effect using a single sound.



This is effective when playing timbres and rhythm tones in stereo. In such cases, pan settings will modify the stereo placement of each partial as follow.



①: Partial 1(3) ②: Partial 2(4)

*When playing in mono, the result will be the same as when the two partials are mixed (as previously explained).

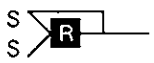
■ Structures using the ring modulator

A ring modulator creates non-harmonic overtones (often found in metallic sounds) by multiplying the sound of two partials.
Using the ring modulator means that, instead of combining partials, you are using one partial to modulate another partial (the fundamental).

● Structures 2, 4, 5, 7

These structures mix the sound of partial 1 (3) with the ring modulated sound of partial 1(3)/partial 2(4).

Structure 2



Structure 4

Structure 5

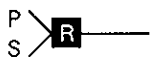
Structure 7

● Structures 10, 11, 12, 13

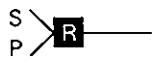
These structures output the ring modulated sound of partial 1(3)/partial 2(4).

Structure 10

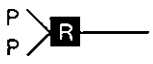
Structure 11



Structure 12



Structure 13



When using the ring modulator, be aware of the following points.

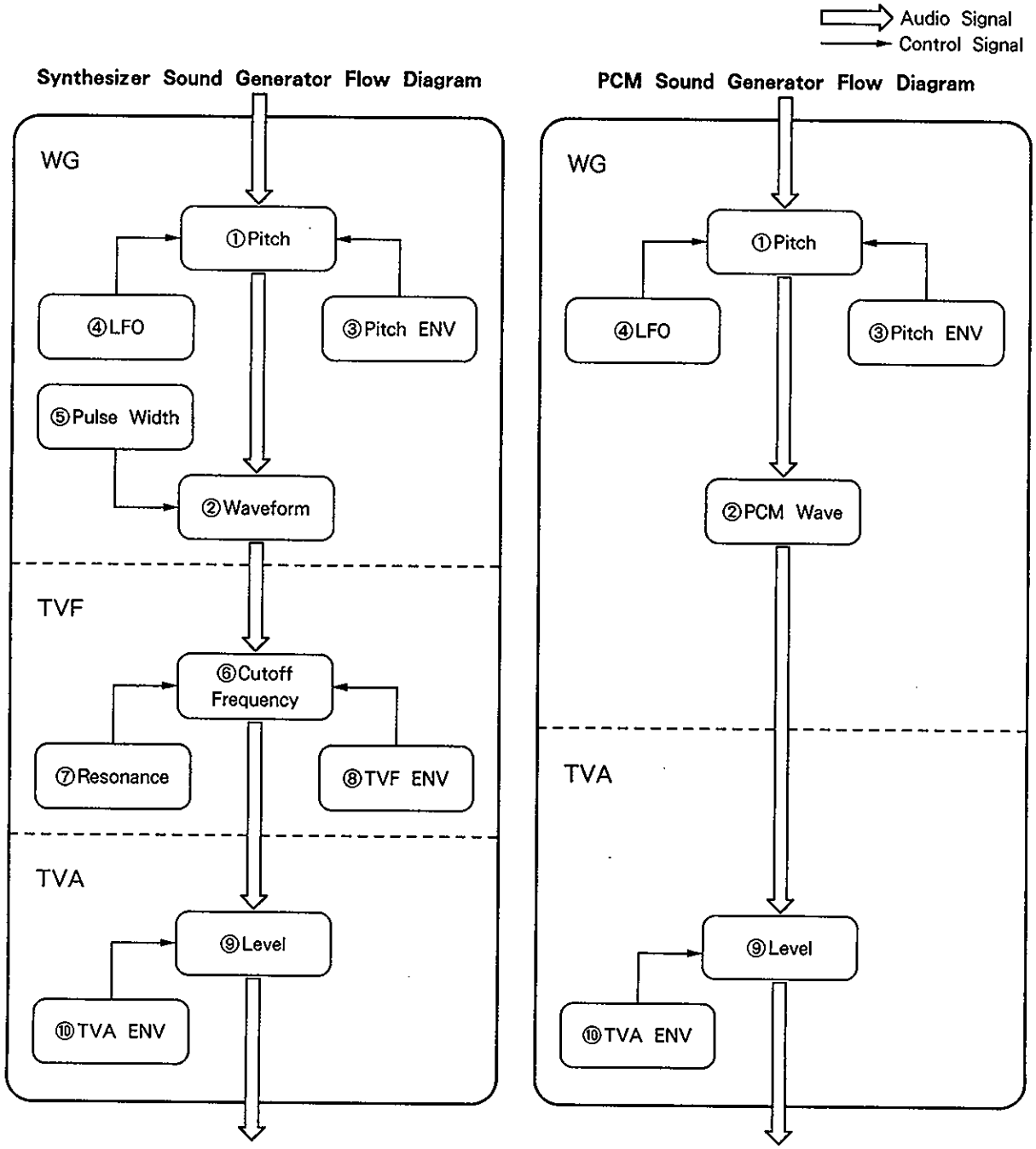
- ○When one of the partials is muted, the sound of the other partial will be output just as it originally was (i.e., without being ring modulated).
- ○Partial 1 (3) forms the fundamental, and partial 2 (4) forms the overtones.
- ○Partial 1 (3) controls the overall volume.
- ○Partial 2 (4) controls the pitch and level of the overtones.
- ○If the pitches of the two partials are in a consonant ratio (a perfect fifth or octave, etc.), the resulting sound will be fairly clear. When creating clear brass sounds, it is useful to keep partial 1 (3) close to a sine wave.

*The TVF cannot be used to change the tone of a PCM sound. However, the ring modulator can be used to add complex overtones to a PCM sound, thus modifying the tone. Also, the TVA envelope of partial 2 (4) can be used to control the overtones, and modify them over time.

3. Partials

Here we will explain how partial parameters are affected by the structure, and the function of each parameter.

The arrangement of a partial will depend on whether it is being used as a synthesizer sound generator or as a PCM sound generator, as follows.



● WG (Wave Generator)

In addition to controlling the standard pitch of the partial, this determines the basic waveform.

①Pitch
Set the standard pitch of the partial (the pitch at C4 "middle C").

②Waveform/PCM Wave Number
Select the sound generator waveform.

③Pitch ENV
Determine how the pitch will change over the time from key on to key off.

④LFO (Low Frequency Oscillator)
The LFO is an oscillator with an extremely slow period (low frequency), and is used to create a cyclic change in pitch (vibrato).

⑤Pulse Width
This changes the shape of the sound generator waveform. (This cannot be used for a PCM sound generator).

● TVF (Time Variant Filter)

This allows frequencies lower than a certain frequency (the cutoff frequency) to pass, and removes the upper portion (i.e., this is a low pass filter), thus changing the overtone structure and modifying the tone. In the case of a PCM sound generator, since the PCM sound itself has its own tone, the TVF cannot be used to control tone.

⑥Cutoff Frequency
This sets the cutoff point of the time variant filter.

⑦Resonance
This allows you to emphasize the overtones near the cutoff point, to create a region of tonal emphasis.

⑧TVF ENV
This determines how the cutoff point will change over the time from key on to key off.

● TVA (Time Variant Amplifier)

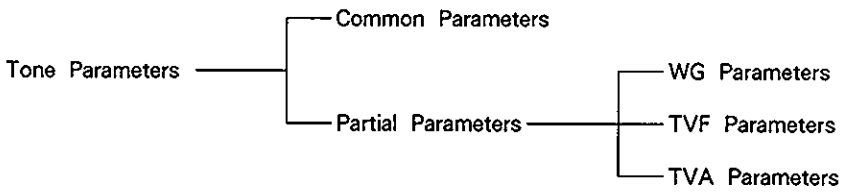
This controlls the volume of the partial.

⑨Level
Set the volume level.

⑩TVA ENV
This determines how the volume will change over the time from key on to key off.

2 TONE PARAMETER FUNCTIONS

A tone consists of various parameters. Here we will be explaining what the various parameters do, grouped by their function.

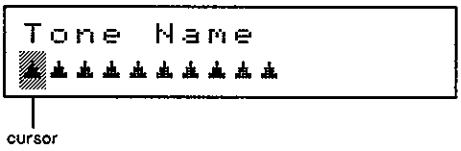


1. Common Parameters

The following common parameters affect the overall tone, and determine how partials are combined.

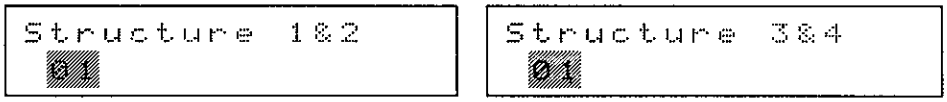
Common Parameters	Value
Tone Name	(space) A—Z a—z 0—9 & # ! ? . , : ; ' " * + − / < = >
Structure 1 & 2	1—13
Structure 3 & 4	1—13
ENV Mode	NORMAL, NO SUSTAIN

● **Tone Name (Value :** (space) A—Z a—z 0—9 & # ! ? . , : ; ' " * + − / < = >)

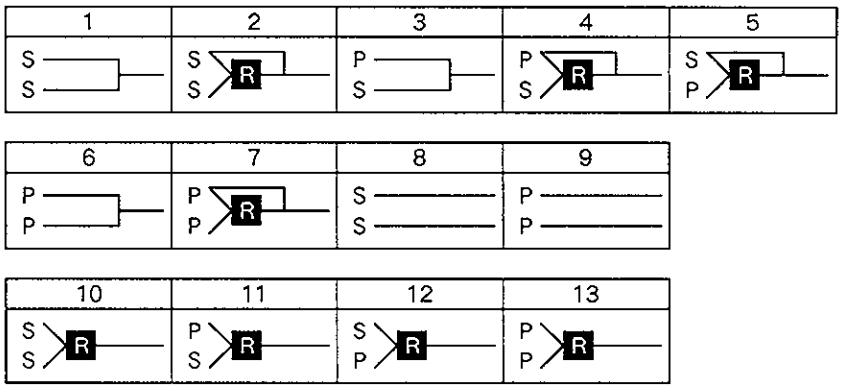


A tone can be given a 10-character name. Use [◄/LOWER] [UPPER/►] to move the cursor to the character you wish to change, and use [◄]VALUE[►] to modify it.

● Structures 1 & 2/3 & 4 (Value : 1 — 13)



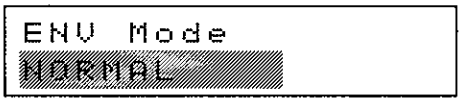
Select a structure from the following 13 types.



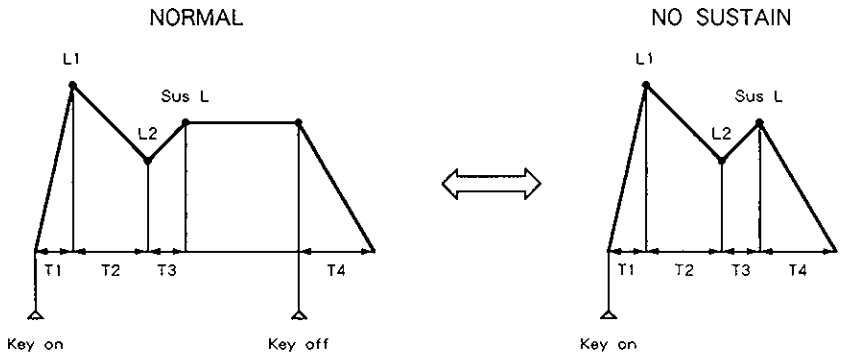
S : Synthesizer Sound Generator
P : PCM Sound Generator

*For a detailed explanation of how to use the various structures, see page 49 "2. Partials and Structures".

● ENV Mode (Value : NORMAL, NO SUSTAIN)



This determines whether or not the envelope of each partial will ignore the key off timing. Usually, you will set this to NORMAL, but when creating rhythm tones, set it to NO SUSTAIN.



*When the ENV mode is set to NO SUSTAIN, the end level of the pitch envelope will sound at the level of point 3.

2. Partial Parameters

Partial parameters can be divided by function into WG/TVF/TVA. Here we will be explaining the parameters in each of the editing groups.

SYNTH ····· indicates a parameter that is effective for a synthesizer sound generator.

PCM ····· indicates a parameter that is effective for a PCM sound generator.

a. WG (Wave Generator) parameters

The WG determines the standard pitch of a partial, and the basic waveform of the sound generator.

S : Parameters effective for a synthesizer sound generator
P : Parameters effective for a PCM sound generator

Group	Partial Parameters	Effective (○) Ignored (×)		Value
		S	P	
WG Pitch/Mod	Pitch Coarse	○	○	C1—C9
	Pitch Fine	○	○	−50—0—+50
	Key Follow (Pitch)	○	○	−1, −1/2, −1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2, s1, s2
	LFO Rate	○	○	0—100
	LFO Depth	○	○	0—100
	Modulation Sensitivity	○	○	0—100
	Bender Switch	○	○	OFF, ON
WG Form/ENV	Waveform	○	×	SQU, SAW
	PCM Wave Bank	×	○	1, 2
	PCM Wave Number	×	○	1—128
	Pulse Width	○	×	0—100
	Pulse Width Velocity Sensitivity	○	×	−7—0—+7
	Pitch ENV Depth	○	○	0—10
	Pitch ENV Velocity Sensitivity	○	○	0—4
	Pitch ENV Key Follow (Time)	○	○	0—4
WG P-ENV	Pitch ENV Time 1, 2, 3, 4	○	○	0—100
	Pitch ENV Level 0, 1, 2, End	○	○	−50—0—+50

■WG Pitch/Modulation Group

● Pitch Coarse (Value : C1 — C9)

SYNTH PCM

This determines the standard pitch of the partial.

* Standard pitch is the pitch of the C4 key (middle C).

● Pitch Fine (Value : −50 — +50 (approximately ± 50 cents))

SYNTH PCM

This is a fine adjustment for the pitch of the coarse setting.

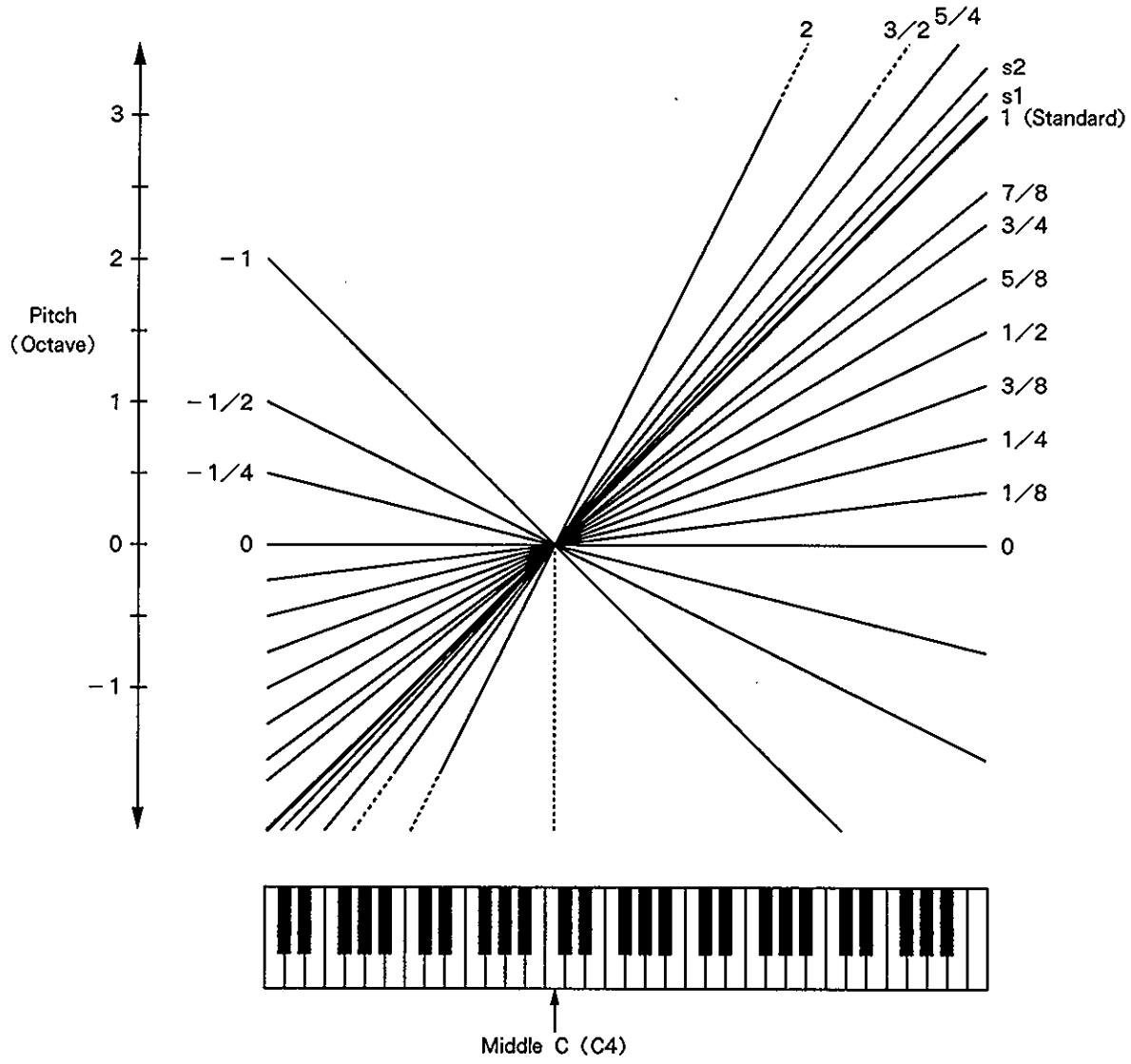
● Pitch Key Follow (Value : −1, −1/2, 1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2, s1, s2)

SYNTH PCM

Most electronic instruments and synthesizers use the equal tempered scale, producing a half step pitch change for each key. On the D-5, this pitch ratio (slope) can be changed, with C4 as the center value. This allows you to use ethnic scales, or create subtle changes in pitch such as found on a piano.

PCM sounds vary greatly in character when transposed. Percussive and scraping sounds do not usually have much variation in pitch, so leaving such sounds near their original pitch area will retain their realism.

The setting indicates the number of octaves of pitch change that occurs when you move up or down the keyboard 12 notes (one octave).

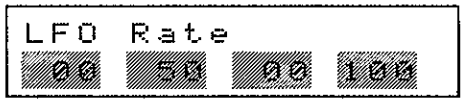


s1 and s2 are used when you want to make a subtle change in octave spacing.

s1 : The pitch of each octave will be 1 cent higher than an octave.
s2 : The pitch of each octave will be 5 cents higher than an octave.

● **LFO Rate (Value : 0—100)**

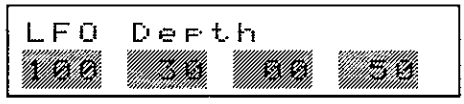
SYNTH **PCM**



You can add vibrato by using the LFO to continue modify the pitch. The LFO rate adjusts the speed of the vibrato. Higher values will result in a faster vibrato.

● **LFO Depth (Value : 0—100)**

SYNTH **PCM**



You can add vibrato by using the LFO to continuously modify the pitch. The LFO depth adjusts the depth of the vibrato. Higher values will result in deeper vibrato.

*Vibrato will function only from point 3 of the Pitch ENV (page 66) to when the key is released.

● **Modulation Sensitvity (Value : 0—100)**

SYNTH **PCM**

This adjusts the sensitivity when using the bender lever to control vibrato. Higher values will result in greater sensitivity, and a slight movement of the bender lever will cause vibrato.

*Vibrato will function only from point 3 of the Pitch ENV (page 66) to when the key is released.

● **Bender Switch (Value : ON, OFF)**

SYNTH **PCM**

This determines whether or not the bender lever will control the pitch. When this is set ON, the bender lever will control the pitch.

*The amount of pitch change caused by the bender lever is determined by the bender range of the patch/timbre.

■WG Form/Pitch ENV Group

● Waveform (Value : SQU, SAW)

SYNTH

Display	Waveform
SQU (Square Wave)	
SAW (Sawtooth Wave)	

*The D-5 creates a sawtooth wave by using the TVF to modify a square wave and then re-calculating the result. This means that even if sawtooth wave is selected, you will be able to use Pulse Width (page 64) to modify the waveform.

● PCM Wave Bank (Value : 1, 2)/PCM Wave Number (Value : 1—128)

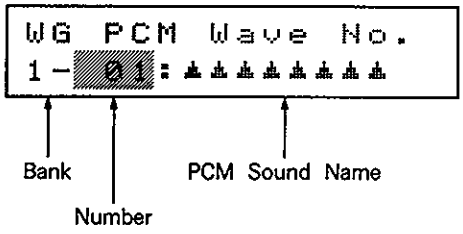
PCM

<PCM Wave Bank>

<PCM Wave Number>

Select one of the 256 types of PCM sound to be used as the basic sound for the PCM sound generator. The PCM sounds are organized in two banks, with 128 numbers in each bank. In the PCM wave bank display, select the bank, and in the PCM wave number display, select the number. (See the following page.)

If you select just one partial in partial select of the PCM wave number display, the PCM sound name will be displayed.



*For bank 1 PCM sounds 112—128, there may be noticable noise during the decay, depending on the TVA Envelope settings (page 75).

Bank 1

No.	PCM Sound Name	Comment
1	Bass Drum – 1	Rhythm Sounds
2	Bass Drum – 2	
3	Bass Drum – 3	
4	Snare Drum – 1	
5	Snare Drum – 2	
6	Snare Drum – 3	
7	Snare Drum – 4	
8	Tom Tom – 1	
9	Tom Tom – 2	
10	High – Hat	
11	High – Hat (Loop)	
12	Crash Cymbal – 1	
13	Crash Cymbal – 2 (Loop)	
14	Ride Cymbal – 1	
15	Ride Cymbal – 2 (Loop)	
16	Cup	
17	China Cymbal – 1	
18	China Cymbal – 2 (Loop)	
19	Rim Shot	
20	Hand Clap	
21	Mute High Conga	
22	Conga	
23	Bongo	
24	Cowbell	
25	Tambourine	
26	Agogo	
27	Claves	
28	Timbale High	
29	Timbale Low	
30	Cabasa	
31	Timpani Attack	Attack Sounds
32	Timpani	
33	Acoustic Piano High	
34	Acoustic Piano Low	
35	Piano Forte Thump	
36	Organ Percussion	
37	Trumpet	
38	Lips	
39	Trombone	
40	Clarinet	
41	Flute High	
42	Flute Low	
43	Steamer	
44	Indian Flute	
45	Breath	
46	Vibraphone High	
47	Vibraphone Low	
48	Marimba	
49	Xylophone High	
50	Xylophone Low	
51	Kalimba	
52	Wind Bell	
53	Chime Bar	
54	Hammer	
55	Guiro	
56	Chink	
57	Nails	
58	Fretless Bass	
59	Pull Bass	
60	Slap Bass	
61	Thump Bass	
62	Acoustic Bass	
63	Electric Bass	
64	Cut Guitar	

No.	PCM Sound Name	Comment
65	Steel Guitar	
66	Dirty Guitar	
67	Pizzicato	
68	Harp	
69	Contrabass	
70	Cello	
71	Violin – 1	
72	Violin – 2	
73	Koto	
74	Draw bars (Loop)	Sustained Sounds
75	High Organ (Loop)	
76	Low Organ (Loop)	
77	Trumpet (Loop)	
78	Troumbone (Loop)	
79	Sax – 1 (Loop)	
80	Sax – 2 (Loop)	
81	Reed (Loop)	
82	Slap Bass (Loop)	
83	Acoustic Bass (Loop)	
84	Electric Bass – 1 (Loop)	
85	Electric Bass – 2 (Loop)	
86	Gut Guital (Loop)	
87	Steel Guitar (Loop)	
88	Electric Guitar (Loop)	
89	Clav (Loop)	
90	Cello (Loop)	
91	Violin (Loop)	
92	Electric Piano – 1 (Loop)	
93	Electric Piano – 2 (Loop)	
94	Harpsichord – 1 (Loop)	
95	Harpsichord – 2 (Loop)	
96	Telephone Bell (Loop)	
97	Female Voice – 1 (Loop)	
98	Female Voice – 1 (Loop)	
99	Male Voice – 1 (Loop)	
100	Male Voice – 2 (Loop)	
101	Spectrum – 1 (Loop)	
102	Spectrum – 2 (Loop)	
103	Spectrum – 3 (Loop)	
104	Spectrum – 4 (Loop)	
105	Spectrum – 5 (Loop)	
106	Spectrum – 6 (Loop)	
107	Spectrum – 7 (Loop)	
108	Spectrum – 8 (Loop)	
109	Spectrum – 9 (Loop)	
110	Spectrum – 10 (Loop)	
111	Noise (Loop)	
112	Shot – 1	Decaying Sounds
113	Shot – 2	
114	Shot – 3	
115	Shot – 4	
116	Shot – 5	
117	Shot – 6	
118	Shot – 7	
119	Shot – 8	
120	Shot – 9	
121	Shot – 10	
122	Shot – 11	
123	Shot – 12	
124	Shot – 13	
125	Shot – 14	
126	Shot – 15	
127	Shot – 16	
128	Shot – 17	

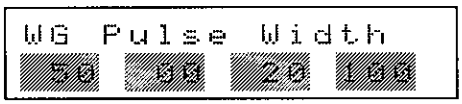
Bank 2

No.	PCM Sound Name	Comment
1	Bass Drum – 1 *	Rhythm Sounds (master tune will not affect the pitch)
2	Bass Drum – 2 *	
3	Bass Drum – 3 *	
4	Snare Drum – 1 *	
5	Snare Drum – 2 *	
6	Snare Drum – 3 *	
7	Snare Drum – 4 *	
8	Tom Tom – 1 *	
9	Tom Tom – 2 *	
10	High – Hat *	
11	High – Hat * (Loop)	
12	Crash Cymbal – 1 *	
13	Crash Cymbal – 2 * (Loop)	
14	Ride Cymbal – 1 *	
15	Ride Cymbal – 2 * (Loop)	
16	Cup *	
17	China Cymbal – 1 *	
18	China Cymbal – 2 * (Loop)	
19	Rim Shot *	
20	Hand Clap *	
21	Mute High Conga *	
22	Conga *	
23	Bongo *	
24	Cowbell *	
25	Tambourine *	
26	Agogo *	
27	Claves *	
28	Timbale High *	
29	Timbale Low *	
30	Cabasa *	
31	Loop – 1	Sound Effects (a loop of the same sound)
32	Loop – 2	
33	Loop – 3	
34	Loop – 4	
35	Loop – 5	
36	Loop – 6	
37	Loop – 7	
38	Loop – 8	
39	Loop – 9	
40	Loop – 10	
41	Loop – 11	
42	Loop – 12	
43	Loop – 13	
44	Loop – 14	
45	Loop – 15	
46	Loop – 16	
47	Loop – 17	
48	Loop – 18	
49	Loop – 19	
50	Loop – 20	
51	Loop – 21	
52	Loop – 22	
53	Loop – 23	
54	Loop – 24	
55	Loop – 25	
56	Loop – 26	
57	Loop – 27	
58	Loop – 28	
59	Loop – 29	
60	Loop – 30	
61	Loop – 31	
62	Loop – 32	
63	Loop – 33	
64	Loop – 34	

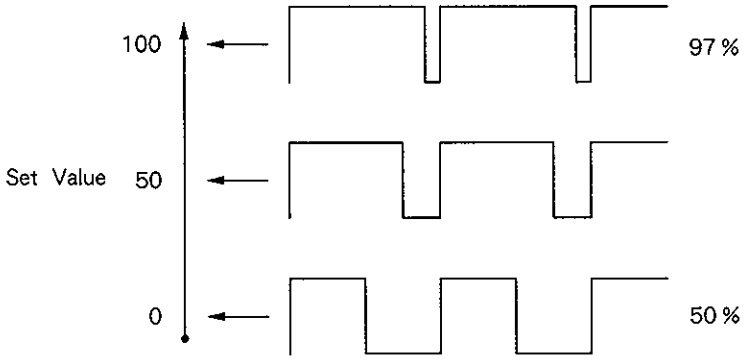
No.	PCM Sound Name	Comment
65	Loop – 35	
66	Loop – 36	
67	Loop – 37	
68	Loop – 38	
69	Loop – 39	
70	Loop – 40	
71	Loop – 41	
72	Loop – 42	
73	Loop – 43	
74	Loop – 44	
75	Loop – 45	
76	Loop – 46	
77	Loop – 47	
78	Loop – 48	
79	Loop – 49	
80	Loop – 50	
81	Loop – 51	
82	Loop – 52	
83	Loop – 53	
84	Loop – 54	
85	Loop – 55	
86	Loop – 56	
87	Loop – 57	
88	Loop – 58	
89	Loop – 59	
90	Loop – 60	
91	Loop – 61	
92	Loop – 62	
93	Loop – 63	
94	Loop – 64	
95	Jam – 1 (Loop)	Sound Effects (a loop of several sounds)
96	Jam – 2 (Loop)	
97	Jam – 3 (Loop)	
98	Jam – 4 (Loop)	
99	Jam – 5 (Loop)	
100	Jam – 6 (Loop)	
101	Jam – 7 (Loop)	
102	Jam – 8 (Loop)	
103	Jam – 9 (Loop)	
104	Jam – 10 (Loop)	
105	Jam – 11 (Loop)	
106	Jam – 12 (Loop)	
107	Jam – 13 (Loop)	
108	Jam – 14 (Loop)	
109	Jam – 15 (Loop)	
110	Jam – 16 (Loop)	
111	Jam – 17 (Loop)	
112	Jam – 18 (Loop)	
113	Jam – 19 (Loop)	
114	Jam – 20 (Loop)	
115	Jam – 21 (Loop)	
116	Jam – 22 (Loop)	
117	Jam – 23 (Loop)	
118	Jam – 24 (Loop)	
119	Jam – 25 (Loop)	
120	Jam – 26 (Loop)	
121	Jam – 27 (Loop)	
122	Jam – 28 (Loop)	
123	Jam – 29 (Loop)	
124	Jam – 30 (Loop)	
125	Jam – 31 (Loop)	
126	Jam – 32 (Loop)	
127	Jam – 33 (Loop)	
128	Jam – 34 (Loop)	

● **Pulse Width (Value : 0—100)**

SYNTH



The ratio of the upper width to the length of one square waveform is called the pulse width. The overtone structure (and therefore the tone) is highly dependent on the pulse width.

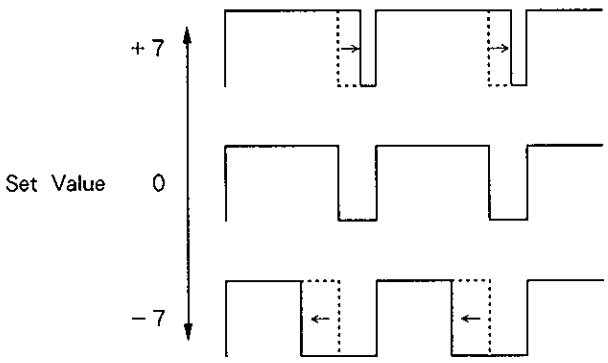


*If the WG waveform is set to sawtooth, 50% pulse width (i.e., a setting of 0) will produce a pitch that is one octave higher.

● **Pulse Width Velocity Sensitivity (Value : −7—0—+7)**

SYNTH

This adjusts the sensitivity of the pulse width to velocity. Positive settings (+) will make the pulse width increase as you play more strongly. Negative settings (−) will make the pulse width decrease as you play more strongly. This allows you to affect the tone by the dynamics of your keyboard playing. When using a sawtooth wave, some settings will allow you to increase the pitch an octave.



● **Pitch ENV Depth (Value : 0—10)**

SYNTH PCM

This adjusts the overall depth of the pitch ENV. Higher settings will result in greater pitch change.

● **Pitch ENV Velocity Sensitivity (Value : 0—3)**

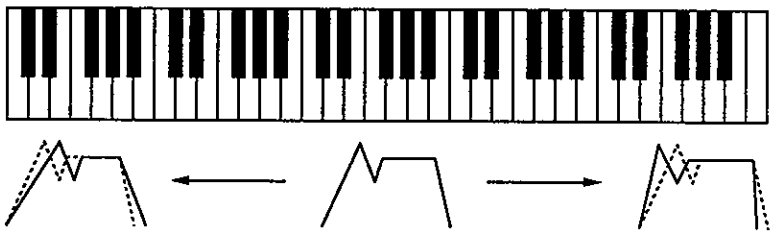
SYNTH PCM

This adjusts the sensitivity of the pitch ENV to velocity. Higher settings will result in greater pitch ENV change as you play more strongly.

● **Pitch ENV Key Follow (Time) (Value : 0—4)**

SYNTH PCM

The rate at which the pitch ENV changes can be made to change depending on the key position. Higher settings will result in faster change for higher notes and slower change for lower notes.

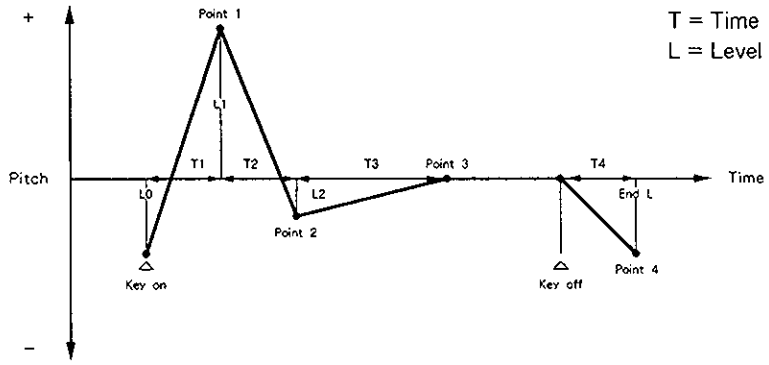


■ Pitch ENV Group

● Pitch ENV Time/Level

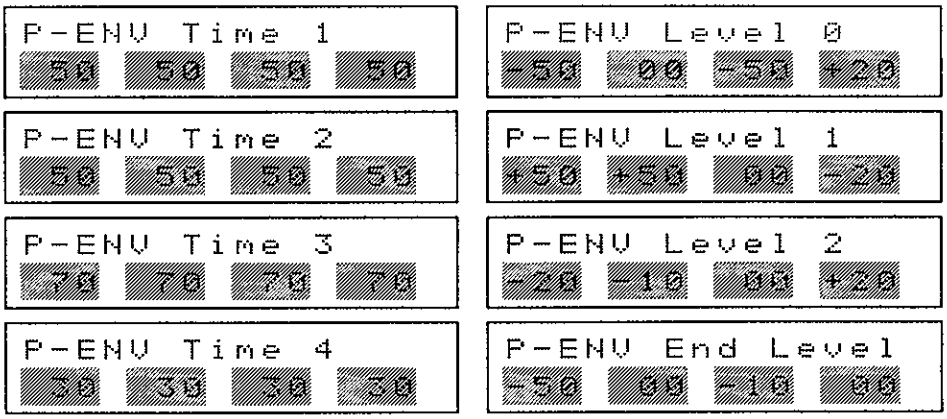
SYNTH PCM

These parameters determine the levels and times of pitch change throughout the note (i.e., the pitch envelope).
Drastic or slow changes in pitch can create interesting sound effects.



Time 1/Time 2/Time 3/Time 4
(Value : 0 — 100)
This determines the time required to reach each point.

Level 0/Level 1/Level 2/End level
(Value : − 50 — + 50)
This sets the pitch level of each point.



*If the ENV mode is set to NO SUSTAIN, the end level will be sounded at point 3.
*If the levels of two adjacent points are set to similar values, the time of change between these points will be shorter than the actual setting (or even zero).
*If the pitch ENV depth setting is at a low value, changing the pitch ENV levels will have little effect.

b. TVF (Time Variant Filter) parameters

This group of parameters determines the tone of a partial. PCM sound generator partials are not affected by TVF settings.

S : Parameters effective for a synthesizer sound generator
P : Parameters effective for a PCM sound generator

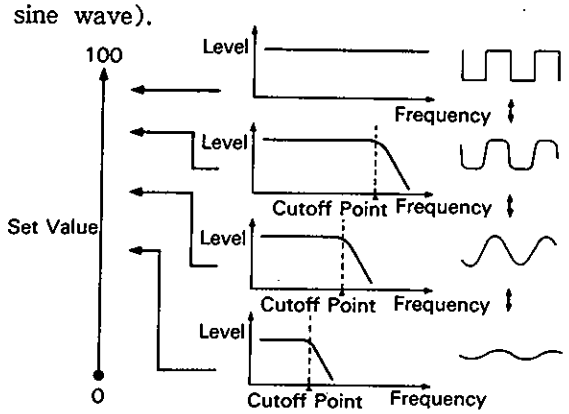
Group	Partial Parameters	Effective (O) Ignored (×)		Value
		S	P	
TVF Freq/ENV	Cutoff Frequency	O	×	0—100
	Resonance	O	×	0—30
	Key Follow	O	×	−1, −1/2, −1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2
	Bias Point	O	×	<A1—<C7, >A1—>C7
	Bias Level	O	×	−7—0—+7
	ENV Depth	O	×	0—100
	ENV Velocity Sensitivity	O	×	0—100
	ENV Key Follow (Depth)	O	×	0—4
TVF ENV	ENV Key Follow (Time)	O	×	0—4
	ENV Time 1, 2, 3, 4	O	×	0—100
	ENV Level 1, 2, Sustain	O	×	0—100

■TVF Frequency/ENV Group

● Cutoff Frequency (Value : 0—100)

SYNTH

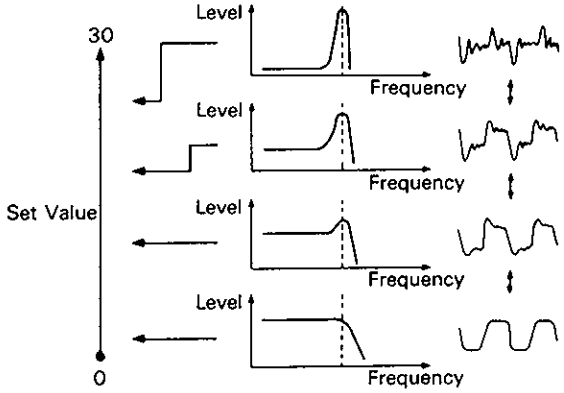
This sets the cutoff frequency of the TVF. Higher settings will result in a brighter (sharper) sound. Lower settings will cause more of the higher frequencies to be cut, resulting in a softer sound (more like a sine wave).



*If this is set too low, there will be no sound at all.

● **Resonance (Value : 0—30)**
SYNTH

This determines the level of the area around the cutoff frequency. Higher settings will raise the level of the overtones in the area near the cutoff frequency, producing a peak of tonal emphasis.



*If this is set too high, the sound may distort.

● **Frequency Key Follow (Value : −1, −1/2, 1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2)**
SYNTH

The cutoff frequency can be made to change according to the key which is played.
In the same way as for WG pitch key follow, this setting determines how many octaves the cutoff frequency will change for every 12 notes on the keyboard. (However there is no setting for s1/s2.)
Positive settings (+) will result in a brighter sound for higher notes, and a softer sound for lower notes.
Negative settings (−) will result in a softer sound for higher notes, and a brighter sound for lower notes.

*This depends also on the cutoff frequency, but extreme settings of frequency key follow can cause the cutoff frequency to be so low that some areas of the keyboard will produce no sound at all.

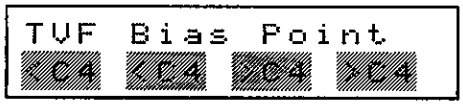
● Bias Point/Bias Level

SYNTH

Bias point and Bias level settings determine the key position from which the frequency key follow setting will begin to apply.

Bias Point (Value : < A1 — < C7, > A1 — > C7)

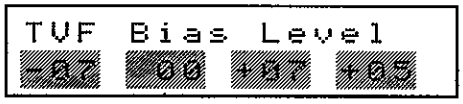
This sets the point (key number) at which to begin biasing, and the direction of the keyboard range to be biased.

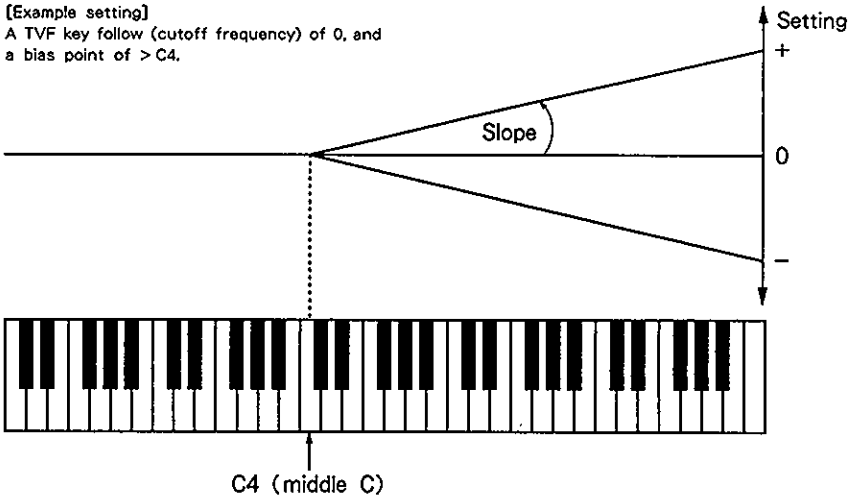


[Example] > C4 : Bias the range to the right of the C4 key.
< C4 : Bias the range to the left of the C4 key.

Bias Level (Value : − 7 — + 7)

This determines the amount of bias that is applied to the frequency key follow. Positive settings (+) will cause upward bias, resulting in brighter sound. Negative settings (−) will cause downward bias, resulting in softer sounds.

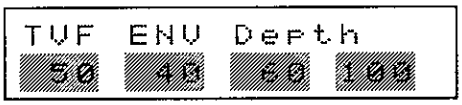




*In the above figure, key follow is 0. However, the actual slope will be the slope specified by key follow + the slope specified by bias level.

● **ENV Depth (Value : 0—100)**

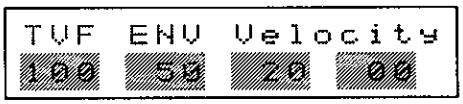
SYNTH



This adjusts the overall depth of the TVF ENV. Higher settings will result in greater change.

● **ENV Velocity Sensitivity (Value : 0—100)**

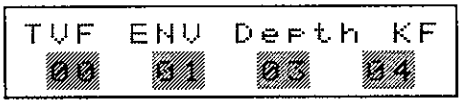
SYNTH



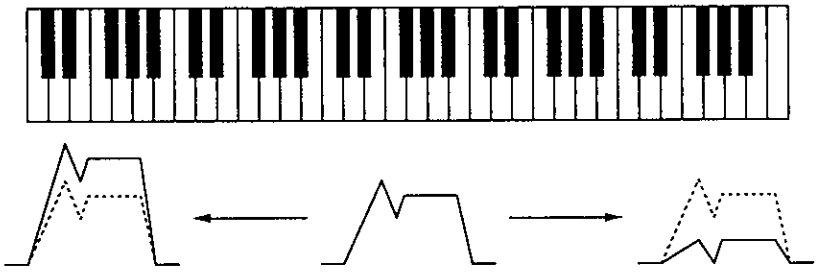
This adjusts the sensitivity of the TVF ENV to velocity. Higher settings will result in greater TVF ENV changes for stronger playing.

● **ENV Key Follow (Depth) (Value : 0—4)**

SYNTH



The TVF ENV depth can be adjusted according to the key that is played. Higher settings will result in greater changes in depth.



■TVF ENV Group

● ENV Key Follow (Time) (Value : 0—4)

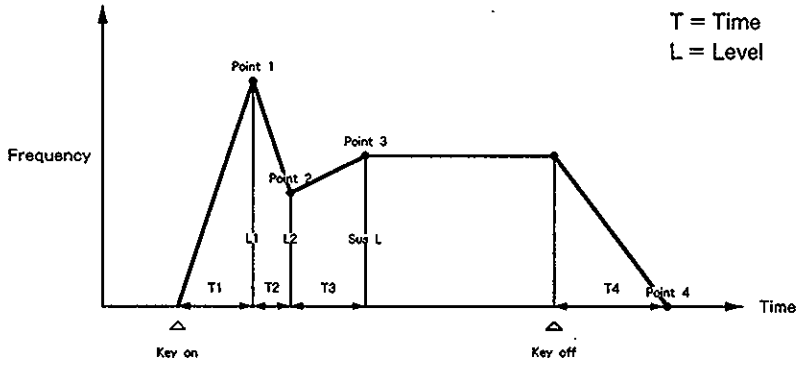
SYNTH

The TVF ENV time can be made faster or slower according to the key that is played. Higher settings will result in faster change for higher notes, and slower change for lower notes.

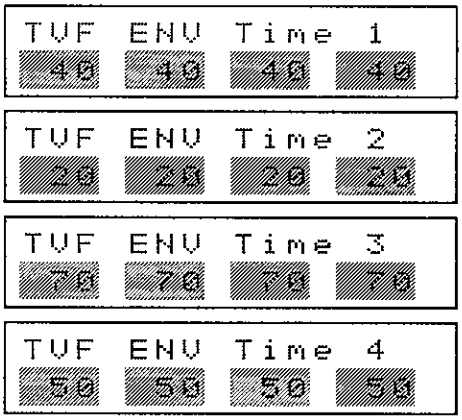
● ENV Time/Level

SYNTH

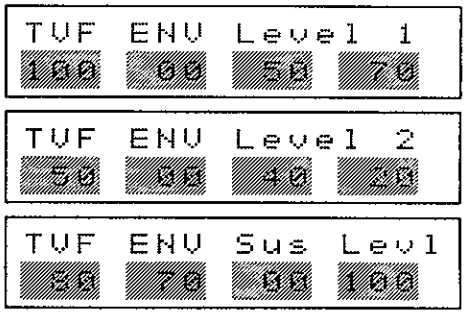
This adjusts the change in cutoff frequency over time (the envelope). The level points determine cutoff frequency levels, and T1—4 determine the time required to reach these levels.



Time 1/Time 2/Time 3/Time 4
(Value : 0—100)
This sets the time required to reach each point.



Level 1/Level 2/Sustain level
(Value : 0—100)
This sets the level of each point.



*If the levels of two adjacent points are set to similar values, the time of change between these points will be shorter than the actual setting (or even zero).
*If the TVF ENV depth setting is at a low value, changing these levels will have little effect on the tone.

c. TVA (Time Variant Amplifier) parameters

This group of parameters determines the volume of the partial.

S : parameters effective for synthesizer sound generators
P : parameters effective for PCM sound generators

Group	Partial Parameters	Effective (○) Ignored (×)		Value
		S	P	
TVA Level	Level	○	○	0—100
	Velocity Sensitivity	○	○	−50—0—+50
	Bias Point 1	○	○	<A1—<C7, >A1—>C7
	Bias Level 1	○	○	−12—0
	Bias Point 2	○	○	<A1—<C7, >A1—>C7
	Bias Level 2	○	○	−12—0
	ENV Velocity Follow (Time 1)	○	○	0—4
TVA ENV	ENV Key Follow (Time)	○	○	0—4
	ENV Time 1, 2, 3, 4	○	○	0—100
	ENV Level 1, 2, Sustain	○	○	0—100

■TVA Level Group

● Level (Value : 0—100)

SYNTH PCM

This adjusts the standard volume of the partial. Higher settings will result in a louder volume. This can be used to adjust the volume balance of the partials.

*Some sounds will be distorted if the volume is too high. If so, lower the volume.
*For high TVA ENV settings, it is possible that there will be some sound even if this TVA level is set to zero.

● Velocity Sensitivity (Value : −50—+50)

SYNTH PCM

This setting allows key velocity to affect the volume. Positive (+) settings will result in a louder volume as you play more strongly. Negative (−) settings will result in a softer volume as you play more strongly. Larger settings will result in a greater range of volume change in response to key velocity.

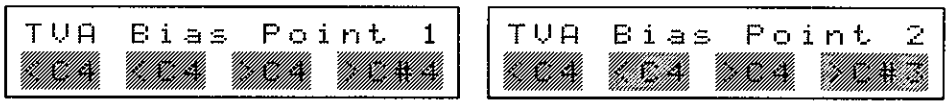
● Bias Point/Bias Level

SYNTH PCM

Bias point and Bias level settings allow you to adjust the volume around a specified key position.

Bias Point (Value : < A1 — < C7, > A1 — > C7)

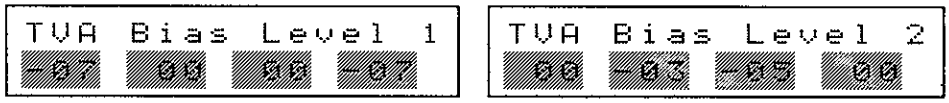
This specifies the key at which to begin adjusting volume, and the direction of adjustment. Two separate positions can be set.



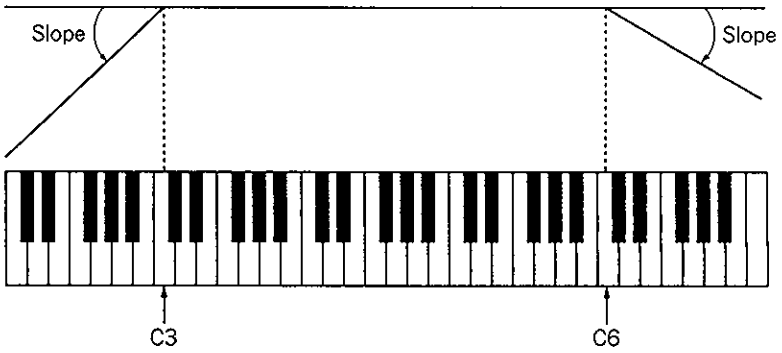
[example] > C4 : Bias the range to the right of the C4 key.
< C4 : Bias the range to the left of the C4 key.

Bias Level (Value : − 12 — 0)

This determines the amount of bias from each point. Lower settings will result in a lower volume after the bias point. As the setting is lowered, the volume change will become more pronounced.

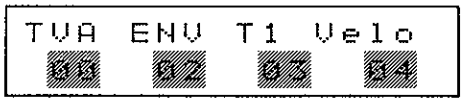


[Example setting] Lower the volume of the lower and upper ranges.
Bias Point 1 : > C6 Bias Level 1 : − 3
Bias Point 2 : < C3 Bias Level 2 : − 5



● ENV Velocity Follow (Time 1) (Value : 0 — 4)

SYNTH PCM



This adjusts the sensitivity of TVA ENV time 1 to velocity. Higher settings will result in a shorter time 1 for strongly played notes.

■TVA ENV group

● ENV Key Follow (Time) (Value : 0—4)

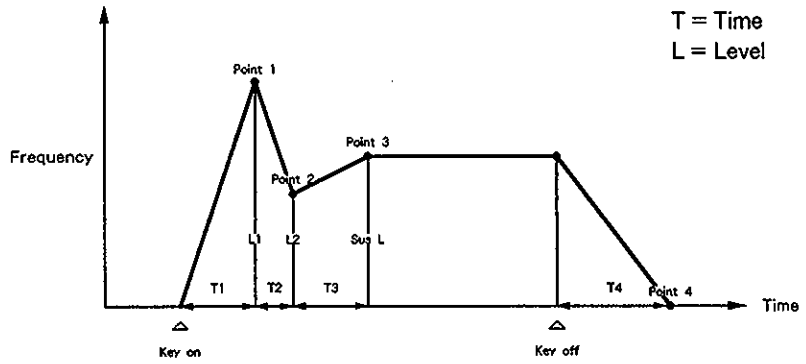
SYNTH PCM

The time change of the TVA ENV can be made faster or slower depending on the key position. Higher settings will result in faster change for higher notes and slower change for lower notes.

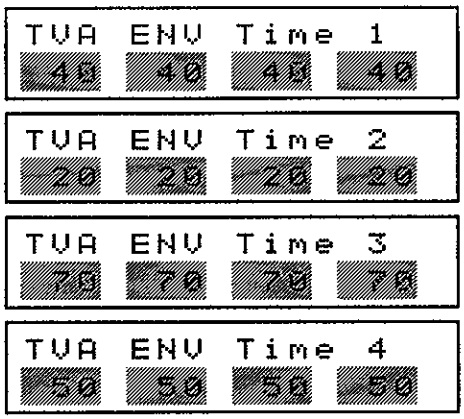
● TVA ENV Time/Level

SYNTH PCM

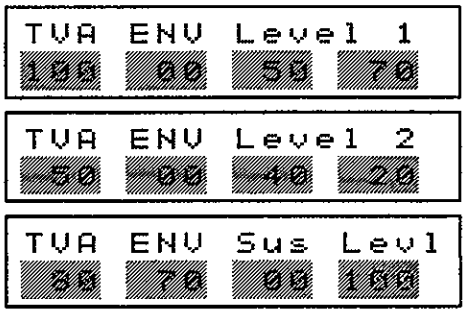
This determines how the volume will change over time (i.e., the volume envelope), by specifying the level of each point and the time required to reach each point.



Time 1/Time 2/Time 3/Time 4
(Value : 0—100)
This sets the time required to reach each point.



Level 1/Level 2/Sustain level
(Value : 0—100)
This sets the volume level of each point.



*If the levels of two adjacent points are set to similar values, the time of change between these points will be shorter than the actual setting (or even zero).

3 EDITING A TONE

This section explains how to edit tone parameters.

1. Editing a Tone

This explains the tone editing procedure, and the various edit functions. Tone parameters can be edited from either Performance mode or Multi Timbral mode.

Serious synthesizer programmers may wish to purchase an optional PG-10 programmer, which allows you to edit parameters quickly and intuitively, just as on an analog synthesizer.

*Edited settings are temporary. When the power is turned off or when another tone is selected, edited settings will revert to the original settings. If you want to keep your edits, be sure to write them into memory (page 83).

a. Selecting a tone

When you want to partially modify an existing tone, select a tone similiar to the sound you have in mind. When you want to create a tone from scratch, select an unwanted tone from group i. The procedure for selecting a tone differs in Performance mode and Multi Timbral mode.

● Selecting a tone in Performance mode

To edit a tone while in Performance mode, use the following procedure to select a tone.

1 **Select a patch which uses the tone you want to edit.**

2 **Press** [EDIT].

```
Edit Select
Patch    Tone
```

3 **Press** [UPPER/►] **to select Tone.**

```
Edit Tone Select
Lower    Upper
```

4 **If editing the lower tone, press [◄/LOWER]. If editing the upper tone, press [UPPER/►].**

```
Common
Select  Parameter
```

The tone editing display (common group) will appear. Now follow the procedure explained in the following section "Selecting and modifying tone parameters".

● Selecting a tone while in Multi Timbral mode

To edit a tone while in Multi Timbral mode, use the following procedure to select a tone.

1 **Get the keyboard display.**

Unless you select a part which can be played by the keyboard, you will not be able to hear the sound as you edit.

2 **Select a timbre which uses the tone you want to edit.**

3 **Press [EDIT].**

```
Edit  Select
Timbre   Tone
```

4 **Press [UPPER/►] to select Tone.**

```
Common
Select  Parameter
```

The tone editing display (common group) will appear. Now follow the procedure explained in the following section "Selecting and modifying tone parameters".

b. Selecting and modifying tone parameters

After using the previously explained procedure to select a tone, edit parameter values using the following procedure.

Tone parameters are organized as follows.
The parameters effective for each partial will differ, depending on how the sound generator is used (synthesizer sound generator or PCM sound generator). During editing, parameters will be displayed regardless of whether they are effective, so be aware which generator you are using.

Group	BANK 1	2	3	4	5	6	7	8
Common	Tone Name	Structure 1 & 2	Structure 3 & 4	ENV Mode				
WG Pitch/ Modulation	Pitch Coarse	Pitch Fine	Key Follow (Pitch)	LFO Rate	LFO Depth	LFO Modulation Sensitivity	Bender Switch	
WG Form/ Pitch ENV	Waveform	PCM Wave Bank	PCM Wave No.	Pulse Width	PW Velocity	ENV Depth	ENV Velocity	ENV Key Follow (Time)
WG Pitch ENV	Time 1	Time 2	Time 3	Time 4	Level 0	Level 1	Level 2	End Level
TVF Frequency	Cutoff Frequency	Resonance	Key Follow	Bias Point	Bias Level	ENV Depth	ENV Velocity	ENV Key Follow (Depth)
TVF ENV	Key Follow (Time)	Time 1	Time 2	Time 3	Time 4	Level 1	Level 2	Sustain Level
TVA Level	Level	Velocity	Bias Point 1	Bias Level 1	Bias Point 2	Bias Level 2	ENV Velocity Follow(Time1)	
TVA ENV	Key Follow (Time)	Time 1	Time 2	Time 3	Time 4	Level 1	Level 2	Sustain Level

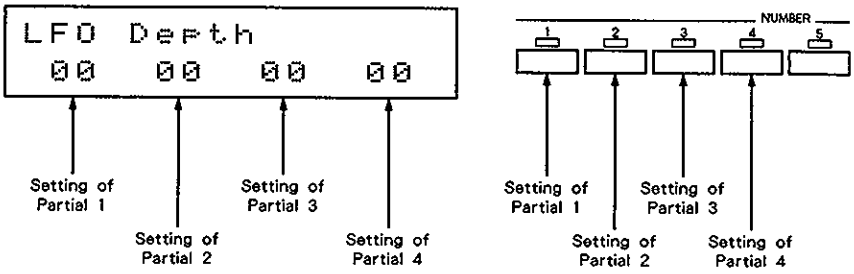
DISPLAY ◄ ► DISPLAY

1 **Press ◄DISPLAY► to select the group of the parameter to edit.**

2 **Press BANK 1—8 to select the parameter to edit.**
If a partial parameter has been selected, parameter settings for all four partials will be displayed.

3 **If a partial parameter has been selected, press NUMBER [1]—[4] to select the partial to be edited.**

The indicator of the button you pressed will light, and the (blinking) value of the parameter can be modified. Each press of a button will turn its indicator on/off, allowing you to simultaneously edit the value of more than one partial.



4 **Using [◄]VALUE[►], modify the value of the selected parameter.**

5 **If you want to save your edits, remember to write them into memory (page 83).**

*To quit editing, press [EXIT]. If you have not written your edits into memory, the settings will return to the unedited values when you select another tone.

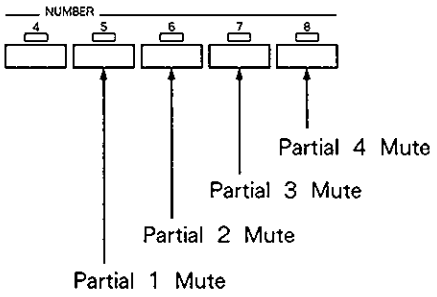
2. Edit Functions

The D-5 has a variety of functions to make editing easy.

a. Partial mute

Partial mute is a tone parameter that lets you mute (turn off) the sound for specified partials. This is useful when you want to compare the sound of individual partials, or want to temporarily turn off partials not being edited.

Use **NUMBER** [5]—[8] to mute or unmute partials. Indicators will be turned off to show which partials are muted. Each press of a button will turn the indicator on/off.



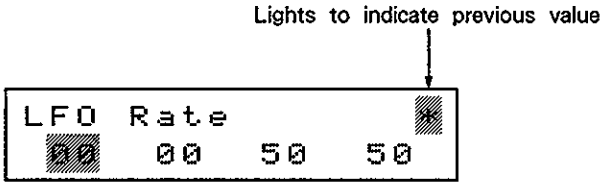
Since each partial mute is a tone parameter, if you write into memory while partials are muted, they will be stored as muted. This means that partials whose indicator is off will not be used. Since partial mute settings determine the number of partials in a tone, the number of unmuted partials will affect the number of sounds that can be produced simultaneously.

* It is possible to edit the values of a muted partial.
* When using the ring modulator, muting one partial will cause the sound of the other partial to be directly output without passing through the ring modulator. When checking the effect of the ring modulator, unmute the pair of partials that are connected to it.

b. Previous value

Previous value is a function which returns the settings of the currently displayed screen to the values shown when the screen was selected. This allows you to return to the unedited value, or compare the edited and unedited sounds.

1 **While editing, press [COMPARE].**
The unedited values will be displayed with an "*", and you will be able to hear the unedited sound.



To return the settings to their unedited values, you can either switch partial select, or move to another screen (the "*" mark disappears). You can also modify parameter settings in this screen to continue editing from the displayed values.

2 **Press [COMPARE] once more to return to the values displayed before you pressed [COMPARE].**

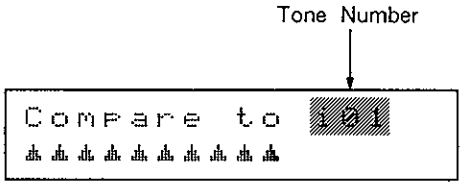
If you move to another parameter screen while the "" is shown, or if you turn off the "*" mark, pressing [COMPARE] will not return you to your edited settings.

c. Compare

Compare is a function which allows you to hear the tone in the destination to which you are about to store a edited tone, to confirm whether you really want to replace that tone. This function can also be used to compare the original and edited sounds.

1 **Press [WRITE].**

2 **Press [COMPARE].**
When you play the keyboard, you will hear the tone as it was before you began editing.

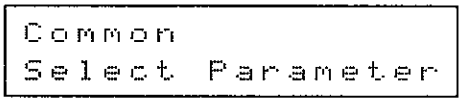


In this display you can press [◄]VALUE[►] to switch the tone number of the writing destination, and hear the selected tones.

*When editing a preset tone, the tone number will not be displayed (the screen will show ****).

3 **Press [COMPARE] once again.**
You will return to the tone being edited.

4 **Press [EXIT].**
You will return to the tone editing display.



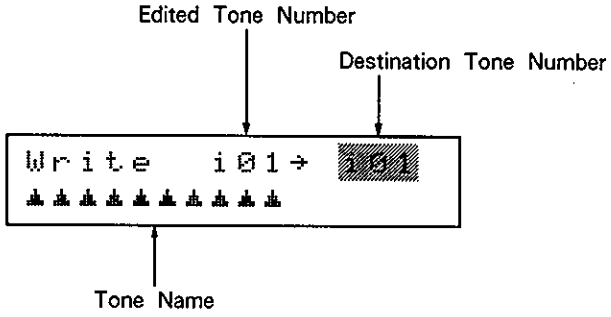
3. Tone Writing Procedure

If you want to keep the tone you have just finished editing, or if you need to turn the power off while you are in the middle of editing, you must use this writing procedure to store a tone into either the D-5's memory (internal) or into an optional memory card.
This section will explain how to write an edited tone into the D-5's memory. To write into a memory card, see "Saving Data into a Memory Card" (page 118).

Edited tones can be stored in either internal group i, or in memory card (RAM) group c. They can not be stored in preset tone groups a, b, r or a ROM card.

While in tone edit, use the following procedure.

1 **Press [WRITE].**
The tone write display will appear.



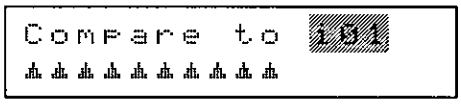
*If you have been editing a preset tone, the destination tone number will not be displayed (the screen will show ***).

2 **If you have been editing a memory card tone, press [INT/CARD] to switch the destination to "i" (internal).**

3 **Use ◄VALUE► to select the destination tone number.**
Select any tone 1—64 that you don't need to keep.

If you want to hear the sound of the destination tone number to make sure that it is one that you don't mind loosing, use the following procedure.

①Press COMPARE.

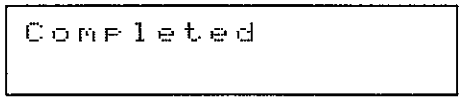


When you press COMPARE, you will be able to play the keyboard to hear the selected tone. You can select other tones and play them as well.

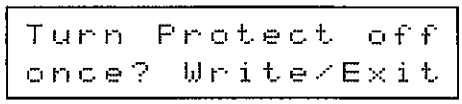
②Press COMPARE once again to return to the writing display.

4 **Press ENTER.**

○If memory protect has been turned off (in the PLAY volume, page 99), the following display will briefly appear if writing is sucessful, and then you will return to play mode.



○If memory protect is on, the following display will appear.



To temporarily turn memory protect off and then write into memory, press WRITE and then press ENTER once again.

*To stop without writing, press EXIT to return to the previous editing display.
*If writing was unsuccessful, an error message will appear. Consult the "Error Messages" section (page 144) and follow the appropriate directions.

4 HINTS FOR SOUND CREATING

The D-5 provides a wide variety of preset tones, which you should take advantage of.
It's great to be able to create your own sounds from scratch, but this can be a rather time-consuming process. It is often more efficient to find a tone that is fairly close to what you have in mind, and make minor edits to get exactly what you want.

1. Check the Combination of Partials

A single tone consists of 4 partials. Settings for each partial are important, but the way in which the partials are combined is also very important.

When you have found a tone that is fairly close to what you want, don't jump right in and start editing. Instead, take a moment to see what the tone settings are. It is also important to check the settings of the patch/timbre that is using that tone, especially when the patch parameter for key mode is set to dual.
It is possible to use functions such as previous value to check the original settings while editing, but it is more efficient to look through the parameters before you start. Once you have identified the important parameters, you will know which parameters need to be modified to get the desired sound.

Here are two hints to help you achieve the sound you want.

● Check the structure

The structure determines how partials are used. There are 13 types of structure, and you should check the following points.

- Does the structure use the ring modulator?
- Are the sound generators PCM or synthesizer?

● Determine the role of each partial

Find out how each partial contributes to the tone. Partials which are already muted are not being used, and can be ignored. Next, listen to the individual partials one by one, to see what each one is doing.

For example, you might consider the following points ;

- Are similar-sounding partials combined?
- Are attack and sustain partials combined?
- Are partials differentiated by velocity sensitivity?
- Are partials of different pitch ranges being used?

a. Acoustic instrument simulations using PCM sounds

PCM sound generators are used to create sounds that would be difficult for the synthesizer sound generators.

For example when creating wind instruments such as a flute, the initial breath sound contains complex overtones that would be impossible to create using a synthesizer sound generator. In such cases, use a PCM sound to create the breath sound.

PCM sounds are not simply sampled sounds, but have been processed to make them usable as ingredients. Each PCM sound has been given a name to help you identify it as a potential ingredient of sound, but you should use your ears in determining how to use each one.

b. Combined partials for thick sounds

When two partials that have similar sounds are given slightly different tunings and combined, the two waveforms will interfere with each other to create a chorusing effect. This is interpreted by the human ear as a thick or rich sound. (Giving two sounds slightly different tunings is known as "detuning".) Or, one of the sounds can be transposed one octave up or down to strengthen the overtone structure and create a richer sound. Combining partials in this way is an effective way to quickly make "fat" sounds.

c. Modify the tone using keyboard dynamics

Acoustic instruments change in tone depending on how they are played. Softly played notes will often have a slightly slower attack, and be slightly softer in tone as well as volume. Synthesizers can simulate the dynamics of acoustic instruments using "velocity".
The D-5 can use velocity to control the WG, TVF, and TVA.

● Pulse width velocity
(For synthesizer sound generators)
Pulse width velocity can be used to control pulse width. When using a square wave, this will make the tone become brighter or softer depending on the dynamics of your playing. When using a saw tooth wave, this will not only affect the tone, but can also raise or lower the pitch by an octave.

● Pitch ENV velocity
(For synthesizer/PCM sound generators)
Playing dynamics can affect the pitch change produced by the pitch ENV.

● TVF ENV velocity
(For synthesizer sound generators)
Playing dynamics can affect the volume. By appropriate settings of TVA velocity, you can make one partial sound for strongly played notes, and another partial sound for softly played notes. This lets you shift to a completely different sound just by varying the strength of your playing.

● TVA ENV velocity follow (Time 1)
(For synthesizer/PCM sound generators)
Playing dynamics can create variations in attack (time 1 of the TVA ENV).

d. Modify the tone by keyboard range

Think of a piano. As you play higher notes, the sound becomes brighter with more high frequencies, the volume decreases, and the decay becomes more rapid. On the other hand as you play lower notes, the volume increases, and the decay time becomes longer. Also, the attack is faster for high notes and slower for low notes. The D-5's key follow and bias parameters can be used to simulate this.
Key follow can also be set for WG, TVF, and TVA.

● Key follow (Pitch)
(For synthesizer/PCM sound generators)
This changes the pitch ratio of the keyboard. In place of the standard equal temperament, this can be used to produce ethnic scales, or create subtle change in octave spacing. Or, you can set this so that all note produce the same pitch, or produce lower pitches as you play toward the right side of the keyboard.

● WG ENV key follow (Time)
(For synthesizer/PCM sound generators)
The pitch ENV can be made to change faster or slower depending on the key that is played.

● TVF key follow (Frequency)
(For synthesizer sound generators)
The cutoff frequency can be made to change depending on the key that is played. If you set this so that the cutoff frequency will rise for higher notes, higher notes will have more high frequencies and be brighter, and lower notes will be softer. The opposite effect is also possible.

● TVF bias point/level
(For synthesizer sound generators)
The slope of the TVF key follow can be adjusted, starting with a specified key. TVF key follow modifies the tone in a single, fixed way across the keyboard. If further adjustment is desired, bias can be used to make changes in specified areas. This could be used to make the tone abruptly brighter from a certain point on the keyboard, or to keep the tone from changing over a certain area.

● TVF ENV key follow (Depth)
(For synthesizer sound generators)
The depth of TVF ENV change can be adjusted according to the key that is played.

● **TVF ENV key follow (Time)**
(For synthesizer sound generators)
The speed of TVF ENV change can be adjusted according to the key that is played.

● **TVA bias point 1/2, level 1/2**
(For synthesizer/PCM sound generators)
The volume can be adjusted over the keyboard, beginning from two specified points.

● **TVA ENV key follow**
(For synthesizer/PCM sound generators)
The depth of TVA ENV change can be adjusted according to the key that is played.
On most acoustic instruments, lower-pitched sounds have a slower attack, and higher pitches have a faster attack. The TVA ENV key follow can be used to simulate this.

e. Using the ring modulator

The ring modulator multiplies the sound of two partials to add complex overtones.

Depending on the structure, there are three ways in which the ring modulator is used.

①Ring modulator is not used.

②The direct sound of the fundamental partial is combined with the ring modulated sound.

③Only the ring modulated sound is output.

When using the ring modulator, be aware of the following points.

○When one partial is muted, the sound of the other partial will be output directly (i.e., without passing through the ring modulator).
○Partial 1 (3) determines the fundamental, and partial 2 (4) determines the overtones.
○Partial 1 (3) determines the overall volume.
○Partial 2 (4) determines the pitch and level of the overtones.
○If the pitches of the two partials are on a consonant ratio (a perfect fifth, an octave, etc.), then the resulting sound will be fairly clear. When creating clear brass sounds, it is effective to make partial 1 (3) close to a sine wave.

The TVF cannot modify the tone of PCM sounds, but by using the ring modulator, complex overtones can be added to PCM sounds. The TVA envelope of partial 2 (4) (which determines the overtones) can be used to modify the overtone content over time. PCM sounds naturally include non-harmonic overtones, so overly high settings for partial 2 (4) TVA level will result in very complex sounds. It is best to use this in moderation.

2. Tone Creating Procedures

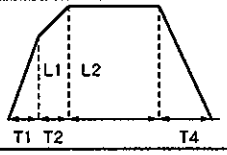
Here we will be explaining actual setting examples and procedures for creating 10 types of sounds.

a. Creating Strings sounds

Strings include a wide variety of sounds. In this example we will be creating an analog synthesizer string sound, and an acoustic string sound typical of a violin or cello.

■ Analog Synth-type Strings

- Select a structure 1 or 8, and use only partials 1/2 (mute partials 3/4).
- For waveform, select SAW (sawtooth) for both partials 1/2.
- Set both the TVA ENV and the TVF ENV to envelopes with a slow attack and a long release.

TVF/TVA ENV		
	T1 = 50 T2 = 50 T3 = 0 T4 = 80	L1 = 75 L2 = 100 SusL = 100

- Set the TVA Velocity fairly high, to create a greater variation in volume.
  (about + 30)
- Set the Pitch LFO to add vibrato.
  (Rate = 60, Depth = 20, Mod.Sens = 50)
- Use the Pitch Fine to detune the pitch of the partials, adding warmth to the sound. (Partial 1 = + 5, Partial 2 = − 5)

After making the above settings, adjust the envelope and LFO Rate of each partial to add finishing touches to the sound. Adjust tone using the TVF Freq. and TVF ENV Depth.

*For an example, see the ex-1 sample chart.

ex-1 : STRINGS

Tone No.						
OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
Common	1	Tone Name	Strings EX			
	2	Structure 1&2	1	S S R		
	3	Structure 3&4		R		
	4	ENV Mode	NORMAL			
WG Pitch/Mod	1	WG Pitch Coarse	C4	C4		
	2	WG Pitch Fine	+3	-3		
	3	WG Pitch KF	1	1		
	4	LFO Rate	59	63		
	5	LFO Depth	27	46		
	6	WG Modulation	56	73		
	7	WG Bender Switch	ON	ON		
WG Form/ENV	1	WG Waveform	SAW	SAW		
	2	WG PCM Wave Bank	-	-		
	3	WG PCM Wave No.	-	-		
	4	WG Pulse Width	48	0		
	5	WG PW Velocity	0	0		
	6	P-ENV Depth	0	0		
	7	P-ENV Velocity	0	0		
	8	P-ENV Time KF	0	0		
WG P-ENV	1	P-ENV Time 1	0	0		
	2	P-ENV Time 2	0	0		
	3	P-ENV Time 3	0	0		
	4	P-ENV Time 4	0	0		
	5	P-ENV Level 0	0	0		
	6	P-ENV Level 1	0	0		
	7	P-ENV Level 2	0	0		
	8	P-ENV End Level	0	0		
Partial Mute			○	○	×	×
Partial			1	2	3	4

OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
TVF Freq/ENV	1	TVF Cutoff Freq	75	75		
	2	TVF Resonance	0	0		
	3	TVF Freq KF	5/8	5/8		
	4	TVF Bias Point	<A1	<A1		
	5	TVF Bias Level	0	0		
	6	TVF ENV Depth	61	61		
	7	TVF ENV Velocity	0	0		
	8	TVF ENV Depth KF	4	4		
TVF ENV	1	TVF ENV Time KF	0	0		
	2	TVF ENV Time 1	21	21		
	3	TVF ENV Time 2	36	36		
	4	TVF ENV Time 3	0	0		
	5	TVF ENV Time 4	90	90		
	6	TVF ENV Level 1	83	83		
	7	TVF ENV Level 2	100	100		
	8	TVF ENV Sus Levl	100	100		
TVA Level	1	TVA Level	80	80		
	2	TVA Velocity	+33	+33		
	3	TVA Bias Point 1	>C4	>C4		
	4	TVA Bias Level 1	0	0		
	5	TVA Bias Point 2	<C4	<C4		
	6	TVA Bias Level 2	0	0		
	7	TVA ENV T1 Velo	3	3		
TVA ENV	1	TVA ENV Time KF	4	4		
	2	TVA ENV Time 1	43	43		
	3	TVA ENV Time 2	50	50		
	4	TVA ENV Time 3	0	0		
	5	TVA ENV Time 4	80	80		
	6	TVA ENV Level 1	76	76		
	7	TVA ENV Level 2	100	100		
	8	TVA ENV Sus Levl	100	100		
Partial Mute			○	○	×	×
Partial			1	2	3	4

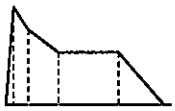
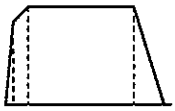
■ Acoustic Strings

- Select structure 3, and use only partials 1/2 (mute partials 3/4).
- For waveform, select a PCM sound 1-70—72 for partial 1, and a synthesizer sound SAW for partial 2.
- Set the envelopes as follows.

Partial 1

TVA ENV		
	T1 = 0 T2 = 30 T3 = 60 T4 = 65	L1 = 100 L2 = 75 SusL = 0

Partial 2

TVF ENV			TVA ENV		
	T1 = 15 T2 = 30 T3 = 60 T4 = 80	L1 = 100 L2 = 75 SusL = 50		T1 = 15 T2 = 30 T3 = 0 T4 = 65	L1 = 80 L2 = 100 SusL = 100

- Use TVA Level to adjust the volume of the two partials (Partial 1 < Partial 2).
- Set a Pitch LFO for only partial 2, to add vibrato.
  (Rate = 64, Depth = 30, Mod.Sens = 50)

In addition, it is possible to create a string sound using only PCM by selecting structure 6, PCM sound 1-90, 91 for partial 2. Experiment with a variety of waveforms.
By using the above two in combination for a total of four partials, you can create a hybrid strings sound that utilizes the unique capabilities of LA synthesis.

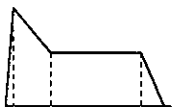
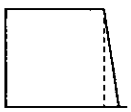
b. Creating Brass sounds

Here we will explain how to create brass sounds, using the examples of a synth brass and a trumpet/trombone.

■ Synth Brass

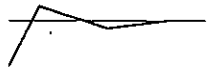
- Select a structure 1 or 8, and use only partials 1/2 (mute partials 3/4).
- Select a synthesizer sound waveform of SAW (sawtooth) for both partials 1/2.
- Set the envelopes as follows.

Partial 1/2

TVF ENV			TVA ENV		
	T1 = 10	L1 = 100		T1 = 0	L1 = 100
	T2 = 60	L2 = 50		T2 = 0	L2 = 100
	T3 = 0	SusL = 50		T3 = 0	SusL = 100
	T4 = 30			T4 = 20	

- For more realism, create a bit of unsteadyness in the pitch using the Pitch ENV settings below.

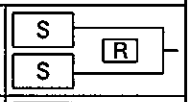
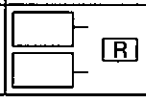
Partial 2

Pitch ENV		
	T1 = 10	L1 = − 30
	T2 = 25	L2 = + 10
	T3 = 20	L3 = − 5
	T4 = 0	EndL = 0

- Use the Pitch LFO to add vibrato.
  (Rate = 63, Depth = 10, Mod.Sense = 50)
- Set the TVF Cutoff Freq. and TVF ENV Depth fairly high. On the other hand, for horn sounds, keep these settings low, and raise the T1 settings of the TVF ENV and TVA ENV to make a slow attack.

*For an example, see the ex-2 sample chart.

ex-2 : SYNTH BRASS

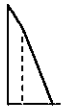
Tone No.						
OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
Common	1	Tone Name	Brass EX			
	2	Structure 1&2	1			
	3	Structure 3&4				
	4	ENV Mode	NORMAL			
WG Pitch/Mod	1	WG Pitch Coarse	C4	C4		
	2	WG Pitch Fine	+6	-6		
	3	WG Pitch KF	1	1		
	4	LFO Rate	63	63		
	5	LFO Depth	7	13		
	6	WG Modulation	38	60		
	7	WG Bender Switch	ON	ON		
WG Form/ENV	1	WG Waveform	SAW	SAW		
	2	WG PCM Wave Bank	-	-		
	3	WG PCM Wave No.	-	-		
	4	WG Pulse Width	0	0		
	5	WG PW Velocity	0	0		
	6	P-ENV Depth	6	0		
	7	P-ENV Velocity	3	0		
	8	P-ENV Time KF	0	0		
WG P-ENV	1	P-ENV Time 1	10	0		
	2	P-ENV Time 2	26	0		
	3	P-ENV Time 3	24	0		
	4	P-ENV Time 4	0	0		
	5	P-ENV Level 0	-27	0		
	6	P-ENV Level 1	+11	0		
	7	P-ENV Level 2	-4	0		
	8	P-ENV End Level	0	0		
Partial Mute			○	○	×	×
Partial			1	2	3	4

OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
TVF Freq/ENV	1	TVF Cutoff Freq	85	90		
	2	TVF Resonance	0	0		
	3	TVF Freq KF	1/2	1/2		
	4	TVF Bias Point	>C5	>D#4		
	5	TVF Bias Level	-2	-3		
	6	TVF ENV Depth	55	60		
	7	TVF ENV Velocity	70	85		
	8	TVF ENV Depth KF	0	0		
TVF ENV	1	TVF ENV Time KF	0	0		
	2	TVF ENV Time 1	6	25		
	3	TVF ENV Time 2	12	63		
	4	TVF ENV Time 3	75	72		
	5	TVF ENV Time 4	25	25		
	6	TVF ENV Level 1	70	100		
	7	TVF ENV Level 2	100	79		
	8	TVF ENV Sus Levl	46	10		
TVA Level	1	TVA Level	85	87		
	2	TVA Velocity	+17	+20		
	3	TVA Bias Point 1	>C4	>C4		
	4	TVA Bias Level 1	0	0		
	5	TVA Bias Point 2	<C4	<C4		
	6	TVA Bias Level 2	0	0		
	7	TVA ENV T1 Velo	0	3		
TVA ENV	1	TVA ENV Time KF	0	0		
	2	TVA ENV Time 1	0	11		
	3	TVA ENV Time 2	0	14		
	4	TVA ENV Time 3	0	0		
	5	TVA ENV Time 4	15	15		
	6	TVA ENV Level 1	100	82		
	7	TVA ENV Level 2	100	100		
	8	TVA ENV Sus Levl	100	100		
Partial Mute			○	○	×	×
Partial			1	2	3	4

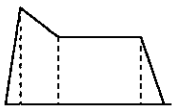
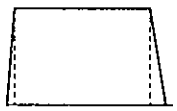
■ Trumpet/Trombone

- Select structure 3, and use only partials 1/2 (mute partials 3/4).
- For waveform, select a PCM sound 1-37—39 for partial 1, and a synthesizer sound SAW for partial 2.
- Set the envelopes as follows.

Partial 1

TVA ENV		
	T1 = 0 T2 = 30 T3 = 60 T4 = 65	L1 = 100 L2 = 75 SusL = 0

Partial 2

TVF ENV			TVA ENV		
	T1 = 20 T2 = 50 T3 = 0 T4 = 30	L1 = 100 L2 = 65 SusL = 65		T1 = 10 T2 = 0 T3 = 0 T4 = 20	L1 = 100 L2 = 100 SusL = 100

- Adjust the volume level of the two partials using TVA Level. (Partial 1 ≒ Partial 2)
- To add vibrato, set a Pitch LFO only for partial 2.
  (Rate = 63, Depth = 20, Mod.Sense = 50)
- Adjust the TVA Cutoff Freq. and TVF ENV Depth of partial 2 to match partial 1 sound.

c. Creating Piano sounds

Here we will explain how to create sounds such as piano, electric piano, and clavi (clavichord).

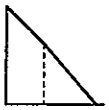
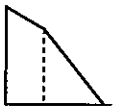
■ Acoustic Piano

- Select structure 3, and use only partials 1/2 (mute partials 3/4).
- Select a PCM sound 1-33—35 for partial 1, and a synthesizer sound SQU for partial 2.
- Set the envelopes as follows.

Partial 1

TVA ENV		
	T1 = 0 T2 = 40 T3 = 60 T4 = 70	L1 = 100 L2 = 80 SusL = 0

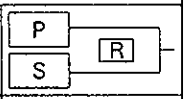
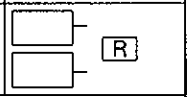
Partial 2

TVF ENV			TVA ENV		
	T1 = 0 T2 = 50 T3 = 70 T4 = 80	L1 = 100 L2 = 60 SusL = 0		T1 = 0 T2 = 50 T3 = 80 T4 = 70	L1 = 100 L2 = 80 SusL = 0

- Set the TVA Velocity fairly high to allow larger changes in volume (higher than + 40).
- Use TVA Level to adjust the volume levels of the two partials. (Partial 1 < Partial 2)
- When using 1-35 (Piano Forte Thump) as the PCM sound for partial 1, Pitch KF can be other than 1.

*For an example, see the ex-3 sample chart.

ex-3 : ACOUSTIC PIANO

Tone No.						
OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
Common	1	Tone Name	Piano EX			
	2	Structure 1&2	3			
	3	Structure 3&4				
	4	ENV Mode	NORMAL			
WG Pitch/Mod	1	WG Pitch Coarse	C3	C4		
	2	WG Pitch Fine	0	0		
	3	WG Pitch KF	s1	1		
	4	LFO Rate	0	0		
	5	LFO Depth	0	0		
	6	WG Modulation	0	0		
	7	WG Bender Switch	ON	ON		
WG Form/ENV	1	WG Waveform	-	SQR		
	2	WG PCM Wave Bank	01	-		
	3	WG PCM Wave No.	33	-		
	4	WG Pulse Width	-	58		
	5	WG PW Velocity	-	+1		
	6	P-ENV Depth	0	0		
	7	P-ENV Velocity	0	0		
	8	P-ENV Time KF	0	0		
WG P-ENV	1	P-ENV Time 1	0	0		
	2	P-ENV Time 2	0	0		
	3	P-ENV Time 3	0	0		
	4	P-ENV Time 4	0	0		
	5	P-ENV Level 0	0	0		
	6	P-ENV Level 1	0	0		
	7	P-ENV Level 2	0	0		
	8	P-ENV End Level	0	0		
Partial Mute			○	○	×	×
Partial			1	2	3	4

OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
TVF Freq/ENV	1	TVF Cutoff Freq	-	58		
	2	TVF Resonance	-	0		
	3	TVF Freq KF	-	3/4		
	4	TVF Bias Point	-	<A4		
	5	TVF Bias Level	-	+3		
	6	TVF ENV Depth	-	28		
	7	TVF ENV Velocity	-	58		
	8	TVF ENV Depth KF	-	0		
TVF ENV	1	TVF ENV Time KF	-	3		
	2	TVF ENV Time 1	-	4		
	3	TVF ENV Time 2	-	51		
	4	TVF ENV Time 3	-	82		
	5	TVF ENV Time 4	-	82		
	6	TVF ENV Level 1	-	100		
	7	TVF ENV Level 2	-	57		
	8	TVF ENV Sus Levl	-	0		
TVA Level	1	TVA Level	100	100		
	2	TVA Velocity	+40	+40		
	3	TVA Bias Point 1	>F5	>C4		
	4	TVA Bias Level 1	-4	0		
	5	TVA Bias Point 2	<A4	<C4		
	6	TVA Bias Level 2	-1	0		
	7	TVA ENV T1 Velo	0	0		
TVA ENV	1	TVA ENV Time KF	3	3		
	2	TVA ENV Time 1	0	0		
	3	TVA ENV Time 2	44	50		
	4	TVA ENV Time 3	67	78		
	5	TVA ENV Time 4	70	70		
	6	TVA ENV Level 1	100	100		
	7	TVA ENV Level 2	87	83		
	8	TVA ENV Sus Levl	0	0		
Partial Mute			○	○	×	×
Partial			1	2	3	4

■ Electric Piano/Clavi

- Select structure 2, and use only partials 1/2 (mute partials 3/4).
- For waveform, select a synthesizer SQU sound for both partials 1/2.
- Set both envelopes the same was as for partial 2 of an acoustic piano.
- Raise the Pitch Coarse of partial 2.
- Use TVA Level to adjust the volume levels of the two partials (Partial 1 ≒ Partial 2). If noise is apparent in the higher ranges, use TVA Bias to lower the level.
- The trick is to set partial 1 to a soft sound (nearly a sine wave), and use partial 2 to add sound which contains alot of overtones. Using the ring modulator will be dificult, since the sound will be unpredictable. Try this over and over, without being afraid to experiment. "Practice makes perfect."
- It is also possible to create the attack portion of an electric piano or a clavi using the ring modulator. In this case, set the envelope of partial 2 to decay quickly.
- It is advisable to create Guitar sound in the same way.

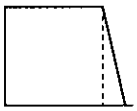
d. Creating Organ sounds

Here we will explain how to create electric organ, pipe organ, and voice sounds.

■ Electric Organ/Pipe Organ

- Select structure 6, and use only partials 1/2 (mute partials 3/4).
- For both partials, select an organ-type loop from PCM sounds 1-74—76.
- Set the envelopes as follows.

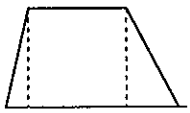
Partial 1/2

TVA ENV		
	T1 = 0 T2 = 0 T3 = 0 T4 = 20	L1 = 100 L2 = 100 SusL = 100

- Use the Pitch LFO to add vibrato.
  (Rate = 60—65, Depth = 40, Mod.Sense = 70)
- It is also effective to set different Pitch LFO Rates for partials 1 and 2.

Square envelopes as shown above will result in an electric organ sound. To create a pipe organ, modify the envelopes as shown in the following diagram.

Partial 1/2

TVA ENV		
	T1 = 30 T2 = 0 T3 = 0 T4 = 70	L1 = 100 L2 = 100 SusL = 100

- To make an even warmer sound, it is effective to separate the pitch of the partials by one octave. For example, use the same waveform for partials 1/2, and set their Pitch Coarse settings at C3 and C4.

*For an example, see the ex-4 sample chart.

ex-4 : ORGAN

Tone No.						
OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
Common	1	Tone Name	Organ EX			
	2	Structure 1&2	6	P P R		
	3	Structure 3&4	3	P R		
	4	ENV Mode	NORMAL			
WG Pitch/Mod	1	WG Pitch Coarse	C3	C4	C4	
	2	WG Pitch Fine	+7	-7	-31	
	3	WG Pitch KF	s2	s2	s2	
	4	LFO Rate	62	65	0	
	5	LFO Depth	37	20	0	
	6	WG Modulation	73	56	0	
	7	WG Bender Switch	ON	ON	ON	
WG Form/ENV	1	WG Waveform	SAW	SAW	-	
	2	WG PCM Wave Bank	01	01	01	
	3	WG PCM Wave No.	75	76	36	
	4	WG Pulse Width	85	98	-	
	5	WG PW Velocity	0	0	-	
	6	P-ENV Depth	0	0	0	
	7	P-ENV Velocity	0	0	0	
	8	P-ENV Time KF	0	0	0	
WG P-ENV	1	P-ENV Time 1	0	0	0	
	2	P-ENV Time 2	0	0	0	
	3	P-ENV Time 3	0	0	0	
	4	P-ENV Time 4	0	0	0	
	5	P-ENV Level 0	0	0	0	
	6	P-ENV Level 1	0	0	0	
	7	P-ENV Level 2	0	0	0	
	8	P-ENV End Level	0	0	0	
Partial Mute			○	○	○	×
Partial			1	2	3	4

OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
TVF Freq/ENV	1	TVF Cutoff Freq	19	16	-	
	2	TVF Resonance	0	0	-	
	3	TVF Freq KF	5/8	1	-	
	4	TVF Bias Point	>C4	>B5	-	
	5	TVF Bias Level	+3	-4	-	
	6	TVF ENV Depth	56	46	-	
	7	TVF ENV Velocity	0	100	-	
	8	TVF ENV Depth KF	0	0	-	
TVF ENV	1	TVF ENV Time KF	0	0	-	
	2	TVF ENV Time 1	0	0	-	
	3	TVF ENV Time 2	0	0	-	
	4	TVF ENV Time 3	0	0	-	
	5	TVF ENV Time 4	42	42	-	
	6	TVF ENV Level 1	100	100	-	
	7	TVF ENV Level 2	100	100	-	
	8	TVF ENV Sus Levl	100	100	-	
TVA Level	1	TVA Level	90	93	92	
	2	TVA Velocity	+31	+31	+18	
	3	TVA Bias Point 1	>C4	>C4	>A3	
	4	TVA Bias Level 1	0	0	-5	
	5	TVA Bias Point 2	<C4	<C4	<C4	
	6	TVA Bias Level 2	0	0	0	
	7	TVA ENV T1 Velo	0	0	0	
TVA ENV	1	TVA ENV Time KF	0	0	0	
	2	TVA ENV Time 1	0	0	0	
	3	TVA ENV Time 2	0	0	37	
	4	TVA ENV Time 3	0	0	45	
	5	TVA ENV Time 4	50	50	50	
	6	TVA ENV Level 1	100	100	100	
	7	TVA ENV Level 2	100	100	70	
	8	TVA ENV Sus Levl	100	100	0	
Partial Mute			○	○	○	×
Partial			1	2	3	4

■ Voice

- Select structure 6, and use only partials 1/2 (mute partials 3/4).
- For waveform, select a voice loop such as PCM sound 1-97 — 100 for both partials 1/2.
- Set the envelopes as follows.

Partial 1/2

TVA ENV		
	T1 = 20 T2 = 40 T3 = 50 T4 = 90	L1 = 50 L2 = 80 SusL = 100

- Give the partials different Pitch Fine settings of ±10 to create a more spacious sound. It is also effective to use structure 9.
- Set different Pitch LFO Rates for partials 1 and 2 to give the sound some motion. (Partial 1 = 60, Partial 2 = 63)
- It is also possible to create a voice sound by using a synthesizer sound SAW, raising the TVF Resonance, and lowering the TVF Cutoff Frequency.
- In addition, use a looped PCM noise sound 1-111 partials or spectrum sound 1-103 for partials 3/4, and add it to partials 1/2 to create realistic breath sounds. (In this case, lower TVA Level, and set Pitch KF to about 1/2, to reduce the pitch change of partials 3/4 over the keyboard.)

*For an example, see the ex-5 sample chart.

ex-5 : VOICE

Tone No.						
OPERATION		PARAMETER	VALUE			
GROUP	BANK					
Common	1	Tone Name	Voice EX			
	2	Structure 1&2	6	P P R		
	3	Structure 3&4	9	P P R		
	4	ENV Mode	NORMAL			
WG Pitch/Mod	1	WG Pitch Coarse	C4	C4	C4	C4
	2	WG Pitch Fine	0	+5	+10	-10
	3	WG Pitch KF	1	1/4	1	1
	4	LFO Rate	62	100	60	63
	5	LFO Depth	44	100	30	30
	6	WG Modulation	74	0	79	79
	7	WG Bender Switch	ON	ON	ON	ON
WG Form/ENV	1	WG Waveform	-	-	-	-
	2	WG PCM Wave Bank	01	01	01	01
	3	WG PCM Wave No.	97	103	98	98
	4	WG Pulse Width	-	-	-	-
	5	WG PW Velocity	-	-	-	-
	6	P-ENV Depth	0	0	0	0
	7	P-ENV Velocity	0	0	0	0
	8	P-ENV Time KF	0	0	0	0
WG P-ENV	1	P-ENV Time 1	0	0	0	0
	2	P-ENV Time 2	0	0	0	0
	3	P-ENV Time 3	0	0	0	0
	4	P-ENV Time 4	0	0	0	0
	5	P-ENV Level 0	0	0	0	0
	6	P-ENV Level 1	0	0	0	0
	7	P-ENV Level 2	0	0	0	0
	8	P-ENV End Level	0	0	0	0
Partial Mute			○	○	○	○
Partial			1	2	3	4

OPERATION		PARAMETER	VALUE			
GROUP	BANK					
TVF Freq/ENV	1	TVF Cutoff Freq	-	-	-	-
	2	TVF Resonance	-	-	-	-
	3	TVF Freq KF	-	-	-	-
	4	TVF Bias Point	-	-	-	-
	5	TVF Bias Level	-	-	-	-
	6	TVF ENV Depth	-	-	-	-
	7	TVF ENV Velocity	-	-	-	-
	8	TVF ENV Depth KF	-	-	-	-
TVF ENV	1	TVF ENV Time KF	-	-	-	-
	2	TVF ENV Time 1	-	-	-	-
	3	TVF ENV Time 2	-	-	-	-
	4	TVF ENV Time 3	-	-	-	-
	5	TVF ENV Time 4	-	-	-	-
	6	TVF ENV Level 1	-	-	-	-
	7	TVF ENV Level 2	-	-	-	-
	8	TVF ENV Sus Levl	-	-	-	-
TVA Level	1	TVA Level	96	60	82	82
	2	TVA Velocity	+35	+43	+35	+35
	3	TVA Bias Point 1	>F6	>A4	>C6	>C6
	4	TVA Bias Level 1	-6	-2	-7	-7
	5	TVA Bias Point 2	<C4	<C4	<C4	<C4
	6	TVA Bias Level 2	0	-6	0	0
	7	TVA ENV T1 Velo	4	4	4	4
TVA ENV	1	TVA ENV Time KF	0	0	0	0
	2	TVA ENV Time 1	21	21	21	21
	3	TVA ENV Time 2	41	42	41	41
	4	TVA ENV Time 3	50	89	50	50
	5	TVA ENV Time 4	86	86	86	86
	6	TVA ENV Level 1	43	73	43	43
	7	TVA ENV Level 2	80	100	79	79
	8	TVA ENV Sus Levl	100	0	100	100
Partial Mute			○	○	○	○
Partial			1	2	3	4

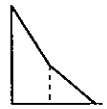
e. Creating Guitar sounds

Here we will explain how to create acoustic guitar and electric guitar sounds.

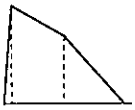
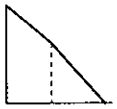
■ Acoustic Guitar

- Select structure 3, and use only partials 1/2 (mute partials 3/4).
- Select a bank 1 PCM sound 64/65 for partial 1, and select a synthesizer sound SQU for partial 2.
- Set the envelopes as follows.

Partial 1

TVA ENV		
	T1 = 0 T2 = 50 T3 = 60 T4 = 60	L1 = 100 L2 = 40 SusL = 0

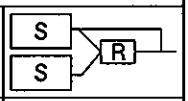
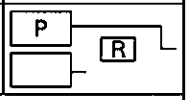
Partial 2

TVF ENV			TVA ENV		
	T1 = 10 T2 = 70 T3 = 80 T4 = 60	L1 = 100 L2 = 70 SusL = 0		T1 = 0 T2 = 60 T3 = 70 T4 = 60	L1 = 100 L2 = 60 SusL = 0

- This is basically similar to a piano envelope, but the decay is a bit faster, and more guitar-like.
- Attack overtones can be created by using the ring modulator (Structure 2) and shortening the decay portion (T2, T3) of partial 2.

*For an example, see the ex-6 sample chart.

ex-6 : ACOUSTIC GUITAR

Tone No.						
OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
Common	1	Tone Name	Guitar EX			
	2	Structure 1&2	2			
	3	Structure 3&4	3			
	4	ENV Mode	NORMAL			
WG Pitch/Mod	1	WG Pitch Coarse	C4	G5	C4	
	2	WG Pitch Fine	0	0	0	
	3	WG Pitch KF	s1	s1	1	
	4	LFO Rate	63	0	0	
	5	LFO Depth	13	0	0	
	6	WG Modulation	87	0	0	
	7	WG Bender Switch	ON	ON	ON	
WG Form/ENV	1	WG Waveform	SQR	SAW	-	
	2	WG PCM Wave Bank	-	-	01	
	3	WG PCM Wave No.	-	-	64	
	4	WG Pulse Width	100	0	-	
	5	WG PW Velocity	0	0	-	
	6	P-ENV Depth	0	6	0	
	7	P-ENV Velocity	0	0	0	
	8	P-ENV Time KF	0	0	0	
WG P-ENV	1	P-ENV Time 1	0	18	0	
	2	P-ENV Time 2	0	8	0	
	3	P-ENV Time 3	0	26	0	
	4	P-ENV Time 4	0	20	0	
	5	P-ENV Level 0	0	+12	0	
	6	P-ENV Level 1	0	-8	0	
	7	P-ENV Level 2	0	+5	0	
	8	P-ENV End Level	0	0	0	
Partial Mute			○	○	○	×
Partial			1	2	3	4

OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
TVF Freq/ENV	1	TVF Cutoff Freq	48	0	-	
	2	TVF Resonance	0	0	-	
	3	TVF Freq KF	1/2	5/8	-	
	4	TVF Bias Point	<A6	<D#4	-	
	5	TVF Bias Level	-3	+1	-	
	6	TVF ENV Depth	53	0	-	
	7	TVF ENV Velocity	0	0	-	
	8	TVF ENV Depth KF	0	0	-	
TVF ENV	1	TVF ENV Time KF	0	0	-	
	2	TVF ENV Time 1	10	0	-	
	3	TVF ENV Time 2	69	0	-	
	4	TVF ENV Time 3	87	0	-	
	5	TVF ENV Time 4	60	0	-	
	6	TVF ENV Level 1	100	0	-	
	7	TVF ENV Level 2	74	0	-	
	8	TVF ENV Sus Levl	0	0	-	
TVA Level	1	TVA Level	97	85	69	
	2	TVA Velocity	+25	+50	+36	
	3	TVA Bias Point 1	>C4	>C4	>C4	
	4	TVA Bias Level 1	-3	0	0	
	5	TVA Bias Point 2	<C4	<C4	<C4	
	6	TVA Bias Level 2	-5	0	0	
	7	TVA ENV T1 Velo	0	0	0	
TVA ENV	1	TVA ENV Time KF	3	3	3	
	2	TVA ENV Time 1	0	0	0	
	3	TVA ENV Time 2	58	64	48	
	4	TVA ENV Time 3	71	82	64	
	5	TVA ENV Time 4	61	61	61	
	6	TVA ENV Level 1	100	100	100	
	7	TVA ENV Level 2	59	67	38	
	8	TVA ENV Sus Levl	0	0	0	
Partial Mute			○	○	○	×
Partial			1	2	3	4

■ Electric Guitar

- Select structure 3, and use only partials 1/2 (mute partials 3/4).
- Select PCM sound 1-66 for partial 1, and select a synthesizer sound SQU for partial 2.
- Envelopes are similar to those for acoustic guitar, but a slower decay should be set for electric guitars (Increase T2 and T3, and decrease T4).
- As you raise the TVF Cutoff Freq., distortion will increase.
- Add vibrato using the Pitch LFO.
  (Rate = 65, Depth = 0, Mod.Sense = 100).
  Pressing the bender lever to the modulation side will result in extreme vibrato.
- When using the ring modulator (Structure 2) to create the sustained sound, lower the Pitch Coarse of partial 2 one octave below partial 1, to create distortion.
- It is also possible to use PCM sounds 1-58—63 as the attack of a bass sound. Setting Pitch KF to less than 1 (1/2—3/4) is also interesting.

f. Creating Bass sounds

Here we will explain how to create sounds such as acoustic bass, electric bass, and synth bass.

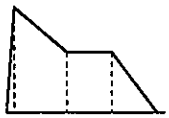
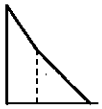
■ Acoustic/Electric Bass

- Select structure 3, and use only partials 1/2 (mute partials 3/4).
- Select PCM sound 1-58—63 for partial 1, and synthesizer sound SQU for partial 2.
- Set the envelopes as follows.

Partial 1

TVA ENV		
	T1 = 0 T2 = 40 T3 = 40 T4 = 30	L1 = 100 L2 = 40 SusL = 0

Partial 1

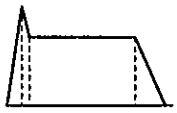
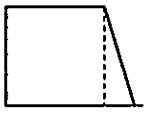
TVF ENV			TVA ENV		
	T1 = 10 T2 = 70 T3 = 0 T4 = 60	L1 = 100 L2 = 50 SusL = 0		T1 = 0 T2 = 40 T3 = 70 T4 = 60	L1 = 100 L2 = 50 SusL = 0

- For acoustic bass, keep the TVF Freq. and TVF ENV Depth at low settings, to create a softer sound. On the other hand for electric bass, raise these settings to create harder sound.
- It is also effective to modify the pulse width of the partial 2 synthesizer sound.

■ Synth Bass

- Select structure 1, and use only partials 1/2 (mute partials 3/4).
- Select either waveform of synthesizer sound for both partials 1/2.
- Set the envelopes as follows.

Partial 1/2

TVF ENV			TVA ENV		
	T1 = 10 T2 = 5 T3 = 0 T4 = 20	L1 = 100 L2 = 70 SusL = 0		T1 = 0 T2 = 0 T3 = 0 T4 = 20	L1 = 100 L2 = 100 SusL = 100

- When the TVF ENV is set as shown above, the attack will be characteristic of a synth bass.
- In addition, raising the TVF Resonance will make the sound even more like a synth bass.
- In order to emphasize the attack, it may be interesting to add a PCM attack sound.

*For an example, see the ex-7 sample chart.

ex-7 : SYNTH BASS

Tone No.						
OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
Common	1	Tone Name	Bass EX			
	2	Structure 1&2	1	S / S → R		
	3	Structure 3&4	3	P / (empty) → R		
	4	ENV Mode	NORMAL			
WG Pitch/Mod	1	WG Pitch Coarse	C4	C3	C4	
	2	WG Pitch Fine	0	0	+3	
	3	WG Pitch KF	s2	s2	s2	
	4	LFO Rate	65	64	0	
	5	LFO Depth	0	0	0	
	6	WG Modulation	100	100	0	
	7	WG Bender Switch	ON	ON	ON	
WG Form/ENV	1	WG Waveform	SAW	SAW	-	
	2	WG PCM Wave Bank	-	-	01	
	3	WG PCM Wave No.	-	-	79	
	4	WG Pulse Width	100	0	-	
	5	WG PW Velocity	+3	0	-	
	6	P-ENV Depth	10	0	9	
	7	P-ENV Velocity	3	0	0	
	8	P-ENV Time KF	0	0	0	
WG P-ENV	1	P-ENV Time 1	2	0	3	
	2	P-ENV Time 2	9	0	0	
	3	P-ENV Time 3	20	0	0	
	4	P-ENV Time 4	0	0	0	
	5	P-ENV Level 0	+35	0	+50	
	6	P-ENV Level 1	-4	0	0	
	7	P-ENV Level 2	0	0	0	
	8	P-ENV End Level	0	0	0	
Partial Mute			○	○	○	×
Partial			1	2	3	4

OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
TVF Freq/ENV	1	TVF Cutoff Freq	57	45	-	
	2	TVF Resonance	17	0	-	
	3	TVF Freq KF	1/2	1/2	-	
	4	TVF Bias Point	<A1	<A1	-	
	5	TVF Bias Level	0	0	-	
	6	TVF ENV Depth	62	80	-	
	7	TVF ENV Velocity	25	100	-	
	8	TVF ENV Depth KF	0	0	-	
TVF ENV	1	TVF ENV Time KF	0	0	-	
	2	TVF ENV Time 1	0	0	-	
	3	TVF ENV Time 2	32	21	-	
	4	TVF ENV Time 3	87	49	-	
	5	TVF ENV Time 4	50	50	-	
	6	TVF ENV Level 1	100	100	-	
	7	TVF ENV Level 2	37	82	-	
	8	TVF ENV Sus Levl	0	33	-	
TVA Level	1	TVA Level	100	100	100	
	2	TVA Velocity	+10	+10	+13	
	3	TVA Bias Point 1	>C4	>C4	>C4	
	4	TVA Bias Level 1	0	0	0	
	5	TVA Bias Point 2	<C4	<C4	<C4	
	6	TVA Bias Level 2	0	0	0	
	7	TVA ENV T1 Velo	0	0	0	
TVA ENV	1	TVA ENV Time KF	0	0	3	
	2	TVA ENV Time 1	0	0	0	
	3	TVA ENV Time 2	65	0	38	
	4	TVA ENV Time 3	0	0	0	
	5	TVA ENV Time 4	15	15	15	
	6	TVA ENV Level 1	100	100	100	
	7	TVA ENV Level 2	85	100	0	
	8	TVA ENV Sus Levl	85	100	0	
Partial Mute			○	○	○	×
Partial			1	2	3	4

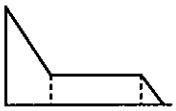
g. Creating Wind instrument sounds

Here we will explain how to create sax and flute sounds.

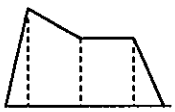
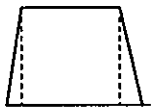
■ Sax

- Select structure 3, and use only partials 1/2 (mute partials 3/4).
- Select a PCM sound 1-79—81 for partial 1, and a synthesizer sound SQU for partial 2.
- Set the envelopes as follows.

Partial 1

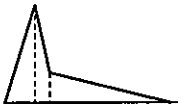
TVA ENV		
	T1 = 0 T2 = 60 T3 = 0 T4 = 30	L1 = 100 L2 = 30 SusL = 30

Partial 2

TVF ENV			TVA ENV		
	T1 = 30 T2 = 70 T3 = 0 T4 = 40	L1 = 100 L2 = 70 SusL = 70		T1 = 20 T2 = 0 T3 = 0 T4 = 30	L1 = 100 L2 = 100 SusL = 100

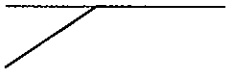
- To create vibrato, set a Pitch LFO only for partial 2. (Rate = 64, Depth = 20, Mod.Sense = 50)
- As with voice sounds, adding a PCM sound noise or spectrum loop will make a realistic breath sound. In this case, set the envelope as follows.

Partial 3 or 4

TVA ENV		
	T1 = 20 T2 = 10 T3 = 80 T4 = 30	L1 = 100 L2 = 30 SusL = 0

- It is even more effective to set a Pitch ENV as follows, so that the pitch will be unsteady during the attack.

Partial 1/2

Pitch ENV			
	T1 = 30 T2 = 0 T3 = 0 T4 = 0	L1 = −40 L2 = 0 L3 = 0 EndL = 0	Depth = 3 — 6

*For an example, see the ex-8 sample chart.

■ Flute

- Select structure 3, and use only partials 1/2 (mute partials 3/4).
- Select a PCM sound 1-40 — 45 for partial 1, and a synthesizer sound SQU for partial 2.
- Set the envelopes as shown above for sax.

ex-8 : SAX

Tone No.						
OPERATION		PARAMETER	VALUE			
GROUP	BANK					
Common	1	Tone Name	Reed EX			
	2	Structure 1&2	3	P / S — R		
	3	Structure 3&4	3	P — R		
	4	ENV Mode	NORMAL			
WG Pitch/Mod	1	WG Pitch Coarse	C5	C4	C3	
	2	WG Pitch Fine	-6	0	0	
	3	WG Pitch KF	1	s1	1/8	
	4	LFO Rate	64	64	0	
	5	LFO Depth	22	22	0	
	6	WG Modulation	50	100	0	
	7	WG Bender Switch	ON	ON	OFF	
WG Form/ENV	1	WG Waveform	-	SQR	-	
	2	WG PCM Wave Bank	01	-	01	
	3	WG PCM Wave No.	79	-	111	
	4	WG Pulse Width	-	68	-	
	5	WG PW Velocity	-	0	-	
	6	P-ENV Depth	5	5	0	
	7	P-ENV Velocity	3	3	0	
	8	P-ENV Time KF	1	1	0	
WG P-ENV	1	P-ENV Time 1	25	25	0	
	2	P-ENV Time 2	25	25	0	
	3	P-ENV Time 3	0	0	0	
	4	P-ENV Time 4	0	0	0	
	5	P-ENV Level 0	-40	-40	0	
	6	P-ENV Level 1	-5	-5	0	
	7	P-ENV Level 2	0	0	0	
	8	P-ENV End Level	0	0	0	
Partial Mute			○	○	○	×
Partial			1	2	3	4

OPERATION		PARAMETER	VALUE			
GROUP	BANK					
TVF Freq/ENV	1	TVF Cutoff Freq	-	48	-	
	2	TVF Resonance	-	16	-	
	3	TVF Freq KF	-	1/2	-	
	4	TVF Bias Point	-	>A4	-	
	5	TVF Bias Level	-	+2	-	
	6	TVF ENV Depth	-	56	-	
	7	TVF ENV Velocity	-	50	-	
	8	TVF ENV Depth KF	-	0	-	
TVF ENV	1	TVF ENV Time KF	-	1	-	
	2	TVF ENV Time 1	-	28	-	
	3	TVF ENV Time 2	-	77	-	
	4	TVF ENV Time 3	-	0	-	
	5	TVF ENV Time 4	-	32	-	
	6	TVF ENV Level 1	-	100	-	
	7	TVF ENV Level 2	-	70	-	
	8	TVF ENV Sus Levl	-	70	-	
TVA Level	1	TVA Level	100	100	94	
	2	TVA Velocity	+45	+6	+28	
	3	TVA Bias Point 1	>A3	>C4	>G3	
	4	TVA Bias Level 1	-7	-3	-3	
	5	TVA Bias Point 2	<C4	<C4	<C4	
	6	TVA Bias Level 2	0	-3	0	
	7	TVA ENV T1 Velo	1	1	1	
TVA ENV	1	TVA ENV Time KF	2	0	2	
	2	TVA ENV Time 1	22	9	20	
	3	TVA ENV Time 2	58	26	24	
	4	TVA ENV Time 3	82	70	70	
	5	TVA ENV Time 4	22	22	38	
	6	TVA ENV Level 1	100	71	100	
	7	TVA ENV Level 2	50	100	6	
	8	TVA ENV Sus Levl	0	90	0	
Partial Mute			○	○	○	×
Partial			1	2	3	4

h. Creating other types of sound

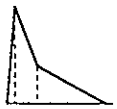
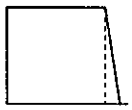
Here we will explain how to create other types of sound such as unique, synthesizer-like sound effects.

Synthesizers can produce any number of unique sounds, and each person will his own preferences. Here we will be explaining how to create a synth lead sound, but we encourage you to use your own ears, to imitate your favorite sounds and modify them to your own liking. As a sound effect, we will be explaining how to make a noise sound.

■ Synthesizer Lead sounds

- Select structure 1, and use only partials 1/2 (mute partials 3/4).
- Select either waveform of synthesizer sound for both partials 1/2.
- Set the envelopes as follows.

Partial 1/2

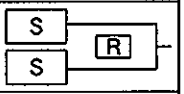
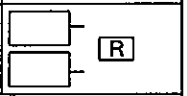
TVF ENV			TVA ENV		
	T1 = 10	L1 = 100		T1 = 0	L1 = 100
	T2 = 30	L2 = 40		T2 = 0	L2 = 100
	T3 = 90	SusL = 0		T3 = 0	SusL = 100
	T4 = 80			T4 = 20	

- To emphasize the attack, set the TVF ENV as shown above. It is effective to raise Resonance to about 25.
- If you set PW Velocity to ±5, your playing dynamics will affect the tone.
- It is also effective to add strong vibrato using the Pitch LFO. (Rate = 66, Depth = 30, Mod.Sense = about 100)
- It is also interesting to use PCM sounds 1-94, 95.

*For an example, see the ex-9 sample chart.

ex-9 : SYNTH LEAD

Tone No.	

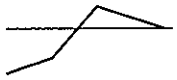
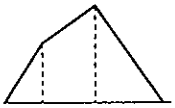
OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
Common	1	Tone Name	Lead EX			
	2	Structure 1&2	1			
	3	Structure 3&4				
	4	ENV Mode	NORMAL			
WG Pitch/Mod	1	WG Pitch Coarse	C4	C4		
	2	WG Pitch Fine	0	0		
	3	WG Pitch KF	1	1		
	4	LFO Rate	66	66		
	5	LFO Depth	22	17		
	6	WG Modulation	72	88		
	7	WG Bender Switch	ON	ON		
WG Form/ENV	1	WG Waveform	SQR	SQR		
	2	WG PCM Wave Bank	-	-		
	3	WG PCM Wave No.	-	-		
	4	WG Pulse Width	55	100		
	5	WG PW Velocity	-2	0		
	6	P-ENV Depth	0	0		
	7	P-ENV Velocity	0	0		
	8	P-ENV Time KF	0	0		
WG P-ENV	1	P-ENV Time 1	0	0		
	2	P-ENV Time 2	0	0		
	3	P-ENV Time 3	0	0		
	4	P-ENV Time 4	0	0		
	5	P-ENV Level 0	0	0		
	6	P-ENV Level 1	0	0		
	7	P-ENV Level 2	0	0		
	8	P-ENV End Level	0	0		
Partial Mute			○	○	×	×
Partial			1	2	3	4

OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
TVF Freq/ENV	1	TVF Cutoff Freq	60	72		
	2	TVF Resonance	28	0		
	3	TVF Freq KF	5/8	1/2		
	4	TVF Bias Point	<A1	<A1		
	5	TVF Bias Level	0	0		
	6	TVF ENV Depth	69	49		
	7	TVF ENV Velocity	0	0		
	8	TVF ENV Depth KF	0	0		
TVF ENV	1	TVF ENV Time KF	2	3		
	2	TVF ENV Time 1	8	0		
	3	TVF ENV Time 2	32	32		
	4	TVF ENV Time 3	79	66		
	5	TVF ENV Time 4	63	63		
	6	TVF ENV Level 1	100	100		
	7	TVF ENV Level 2	36	82		
	8	TVF ENV Sus Levl	0	0		
TVA Level	1	TVA Level	84	75		
	2	TVA Velocity	+26	+30		
	3	TVA Bias Point 1	>C4	>84		
	4	TVA Bias Level 1	0	-4		
	5	TVA Bias Point 2	<C4	<C4		
	6	TVA Bias Level 2	0	0		
	7	TVA ENV T1 Velo	0	0		
TVA ENV	1	TVA ENV Time KF	0	3		
	2	TVA ENV Time 1	2	8		
	3	TVA ENV Time 2	0	18		
	4	TVA ENV Time 3	0	0		
	5	TVA ENV Time 4	24	30		
	6	TVA ENV Level 1	100	85		
	7	TVA ENV Level 2	100	100		
	8	TVA ENV Sus Levl	100	100		
Partial Mute			○	○	×	×
Partial			1	2	3	4

■ Sound Effects

- Select structure 3, and use only partial 1 (mute partials 2/3/4).
- Select PCM sound 1-111.
- Set the envelopes as follows. The Pitch ENV settings are the key to this example.

Partial 1

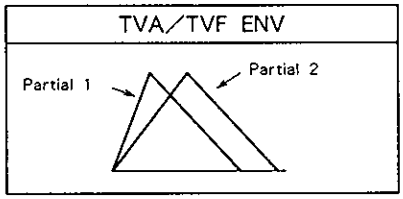
Pitch ENV			TVA ENV		
	T1 = 70	L0 = -50		T1 = 50	L1 = 60
	T2 = 70	L1 = -35		T2 = 70	L2 = 100
	T3 = 100	L2 = +30		T3 = 90	SusL = 0
	T4 = 0	EndL = 0		T4 = 90	

- It is also effective to set the ENV Mode to NO SUSTAIN.

To create other types of sound effect, note the following points.

- Make good use of PCM sounds 2-95 — 128 (Jam Loop). For example, set each partial to a PCM sound Jam Loop, and use the ring modulator with structure 13 for some interesting results.
- Make good use of PCM sound 1-111 Noise.
- Use structures 8/9 with stereo output, and make different TVF ENV and TVA ENV settings for each partial to create panning effects.

Partial 1 Partial 2



*For an example, see the ex-10 sample chart.

ex-10 : SOUND EFFECT

Tone No.						
OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
Common	1	Tone Name	SE EX			
	2	Structure 1&2	3	P / R		
	3	Structure 3&4		R		
	4	ENV Mode	NO Sustain			
WG Pitch/Mod	1	WG Pitch Coarse	C4			
	2	WG Pitch Fine	0			
	3	WG Pitch KF	s1			
	4	LFO Rate	0			
	5	LFO Depth	0			
	6	WG Modulation	0			
	7	WG Bender Switch	ON			
WG Form/ENV	1	WG Waveform	-			
	2	WG PCM Wave Bank	01			
	3	WG PCM Wave No.	111			
	4	WG Pulse Width	-			
	5	WG PW Velocity	-			
	6	P-ENV Depth	8			
	7	P-ENV Velocity	3			
	8	P-ENV Time KF	2			
WG P-ENV	1	P-ENV Time 1	68			
	2	P-ENV Time 2	72			
	3	P-ENV Time 3	96			
	4	P-ENV Time 4	0			
	5	P-ENV Level 0	-50			
	6	P-ENV Level 1	-35			
	7	P-ENV Level 2	+31			
	8	P-ENV End Level	0			
Partial Mute			○	×	×	×
Partial			1	2	3	4

OPERATION GROUP	OPERATION BANK	PARAMETER	VALUE			
TVF Freq/ENV	1	TVF Cutoff Freq	-			
	2	TVF Resonance	-			
	3	TVF Freq KF	-			
	4	TVF Bias Point	-			
	5	TVF Bias Level	-			
	6	TVF ENV Depth	-			
	7	TVF ENV Velocity	-			
	8	TVF ENV Depth KF	-			
TVF ENV	1	TVF ENV Time KF	-			
	2	TVF ENV Time 1	-			
	3	TVF ENV Time 2	-			
	4	TVF ENV Time 3	-			
	5	TVF ENV Time 4	-			
	6	TVF ENV Level 1	-			
	7	TVF ENV Level 2	-			
	8	TVF ENV Sus Levl	-			
TVA Level	1	TVA Level	95			
	2	TVA Velocity	+37			
	3	TVA Bias Point 1	>C3			
	4	TVA Bias Level 1	-4			
	5	TVA Bias Point 2	<C4			
	6	TVA Bias Level 2	0			
	7	TVA ENV T1 Velo	1			
TVA ENV	1	TVA ENV Time KF	2			
	2	TVA ENV Time 1	49			
	3	TVA ENV Time 2	70			
	4	TVA ENV Time 3	84			
	5	TVA ENV Time 4	90			
	6	TVA ENV Level 1	62			
	7	TVA ENV Level 2	100			
	8	TVA ENV Sus Levl	0			
Partial Mute			○	×	×	×
Partial			1	2	3	4

MEMO

SECTION V

OTHER FUNCTIONS

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1 USING THE MEMORY CARD

Two types of optional memory card are provided ; ROM type and RAM type. Here we will explain how to store data into a memory card (RAM), and how to store RAM/ROM data into internal memory.

1. Saving Data into a Memory Card (RAM)

RAM type memory cards (M-256D, M-256E) can be used to store your original patch/timbre/tone sound data, or rhythm setup data. You can store your own sounds to create a personal sound library.

When using a memory card, note the following points.

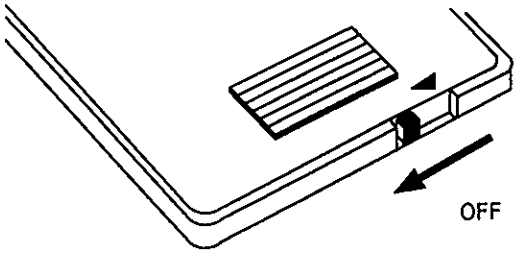
- When using a new memory card, you must first store the data of the entire internal memory into the memory card (page 120) before the memory card can be used. This operation is called "save". In the same way, if a memory card has been used by other devices, you must save the entire memory into the memory card before using it with the D-5. If data has been saved to a memory card, the D-5 will be able to use memory card patches/timbres. In the same way as internal patches/timbres, settings in a memory card can be edited one by one, and written.

- The tone groups that can be used by internal and memory card are different. a, b, and r groups can be used by both, but i group tones can be used only by internal, and c group tones can be used only by memory card.
  This means that if a patch/timbre which uses i group tones is written into a memory card, it will change to c group tones. If i group and c group contain different tone settings, the sound will be different. The same is true when storing from memory card into internal. To avoid such accidents, keep the same tone settings in both internal and memory card.

a. About the protect switch

A memory card has a protect switch to keep data from being accidentally erased.

If the protect switch is on, card sound data can be used, but it will not be possible to store edited settings into the card. Normally, you will keep the protect switch on, but when writing or saving data into a memory card, turn its protect switch off.



*For details of the D-5's memory protect, see in the PLAY volume page 99.

b. When using a new memory card

When using a new memory card, you must first store the entire data of the D-5 into the card before it can be used.

1 **Insert the memory card into the card slot on the rear panel of the D-5.**

*Check that the correct side of the memory card is facing upwards, and push it into the slot.

2 **Turn the memory card's memory protect switch off.**
(See the previous explanation of the protect switch.)

3 **Press [DATA TRANSFER].**

```
Card Select
Save      Load
```

4 **Press [◄/LOWER] to select "Save".**

```
Card Save Select
All
```

5 **Press either of [◄/LOWER] [UPPER/►] to select "All".**

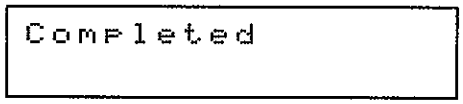
```
Card Save      All
Sure?        Enter
```

6 **Press [ENTER].**

```
Wrong Card
            Enter
```

7 **Press ENTER once again.**

The following display will appear for a short time, and you will return to the previous play mode display, indicating that save has been completed.



*If the data was not correctly written, an error message will be displayed. Consult "Error Messages" on page 144, and take appropriate action.

8 **Turn the memory card's protect switch on again.**

c. Saving patches/timbres (Writing procedure)

Saving individual patch/timbre settings into a memory card one by one is called "writing".

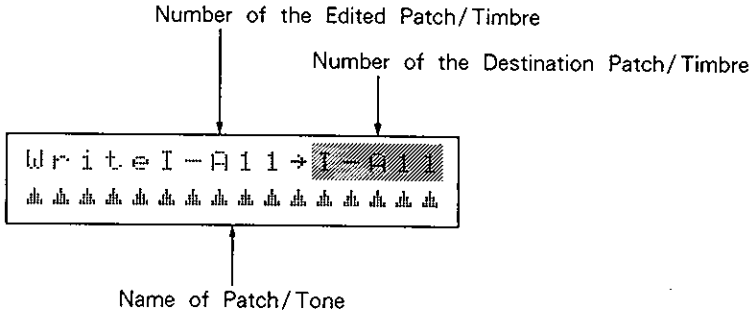
A timbre can be written while editing (in any timbre parameter display) or in Multi Timbral play mode. When writing from play mode, the currently displayed timbre will be written.

1 **Insert the memory card into the card slot.**

*Check that the correct side of the memory card is facing upwards, and push it into the slot.

2 **Turn the memory card's memory protect switch off.**

3 **Press [WRITE].**
The patch/timbre writing display will appear.



4 **When editing internal patches/timbres, press [INT/CARD] to switch the writing destination to "C" (card).**

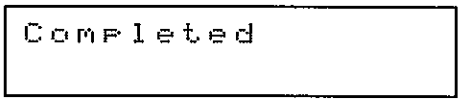
5 **Press [A/B], BANK [1]—[8], NUMBER [1]—[8] to select the storage destination of the edited patch/timbre. If you intend to store it into the same patch/timbre location, there is no need to select the destination.** If you want to hear the sound of the writing destination patch/timbre to check whether or not it is ok to replace it, use the following procedure.

①Press [COMPARE].

After pressing [COMPARE], you will be able to hear the sound of the selected timbre when you play the keyboard. At this time you can select and hear other timbres as well.

②Press [COMPARE] once again to return to the writing display.

6 **Press [ENTER].**
If writing is successfully completed, the following display will briefly appear, and you will return to play mode.



*If you press [EXIT] during the write procedure, you will return to the patch/timbre editing display. If you want to continue the write procedure, press [WRITE] once again. If you select another patch/timbre without pressing [WRITE], your edits will be lost.
*If the data was not correctly written, an error message will be displayed. Consult "Error Messages" on page 144, and take appropriate action.

7 **Turn the memory card's protect switch on again.**

d. Storing tones (Writing procedure)

This explains the procedure for writing edited tone settings into a memory card one by one.

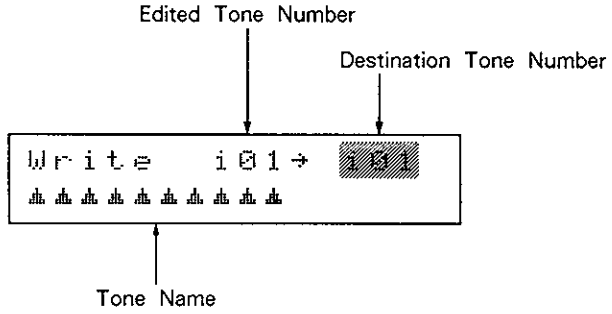
While in tone editing, use the following procedure.

1 **Insert the memory card into the card slot.**

*Check that the correct side of the memory card is facing upwards, and push it into the slot.

2 **Turn the memory card's memory protect switch off.**

3 **Press [WRITE].**
The tone writing display will appear.



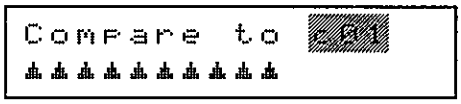
*When editing a preset tone, the tone number of the destination will not be shown. (The display will show ***.)

4 **When editing an internal tone, press [INT/CARD] to switch the writing destination to "c" (card).**

5 **Press [◄]VALUE[►] to select the storage destination of the tone. Select a tone 1—64 which you don't mind writing over.**

If you want to hear the sound of the writing destination tone to check whether or not it is ok to replace it, use the following procedure.

①Press [COMPARE].

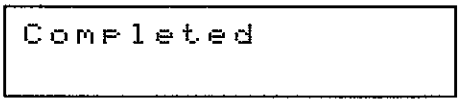


After pressing [COMPARE], you will be able to hear the sound of the selected tone when you play the keyboard. At this time you can select and hear other tones as well.

②Press [COMPARE] once again to return to the writing display.

6 **Press [ENTER].**

If writing is successfully completed, the following display will briefly appear, and you will return to play mode.



*If you press [EXIT] during the write procedure, you will return to the tone editing display. If you want to continue the write procedure, press [WRITE] once again. If you select another tone without pressing [WRITE], your edits will be lost.

*If the data was not correctly written, an error message will be displayed. Consult "Error Messages" on page 144, and take appropriate action.

7 **Turn the memory card's protect switch on again.**

e. Storing data by block (Save)

Storing an entire group of internal data into the memory card is called "saving". Normally, you will save patch/timbre/tone sound data together with rhythm setup data. However, it is also possible to save data in separate blocks.

1 **Insert the memory card into the card slot.**

2 **Turn the memory card's memory protect switch off.**

3 **Press [DATA TRANSFER].**

```
Card Select
Save      Load
```

4 **Press [◀/LOWER] to select "Save".**

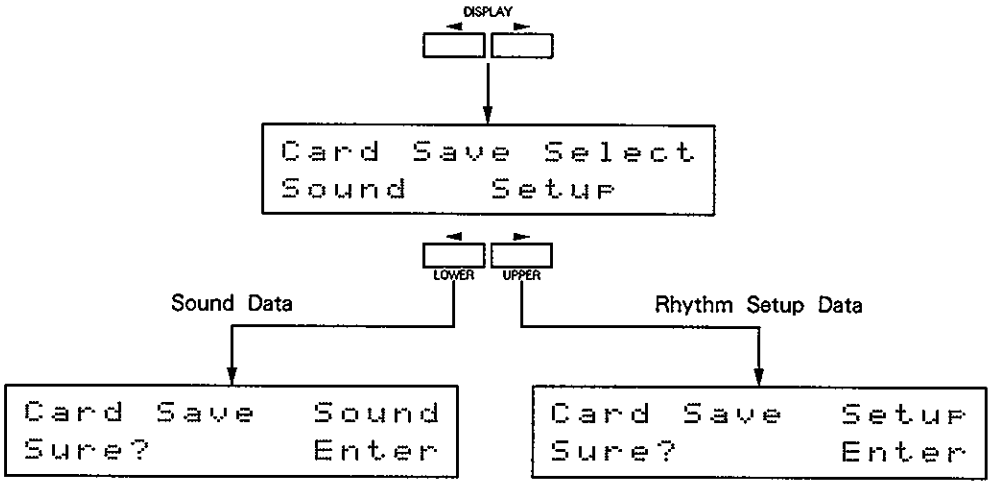
```
Card Save Select
All
```

5 Select the block of data you want to save.

○If you want to save all data, press either of [◄/LOWER] [UPPER/►].

```
Card Save      All
Sure?         Enter
```

○If you want to save individual blocks of data, press [◄]DISPLAY[►] to switch the display, and press [◄/LOWER] [UPPER/►] to select a block.



6 Press [ENTER].

If saving is successfully completed, the following display will briefly appear, and you will return to play mode.

```
Completed
```

*If the data was not correctly saved, an error message will be displayed. Consult "Error Messages" on page 144, and take appropriate action.

7 Turn the memory card's protect switch on again.

2. Copying Memory Card Data into the D-5 (Load)

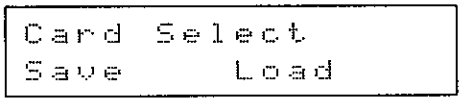
Storing an entire set of memory card data into internal memory is called "loading". Normally, you will load patch/timbre/tone sound data along with rhythm setup data, but it is also possible to load individual blocks of data.

*The D-5 can use sound libraries (PN-D10-01 etc.) for the D-10/D-20, but is not compatible with some data for the D-10 etc. When using sound libraries, consult the section on page 130 concerning D-10/D-20 compatibility.

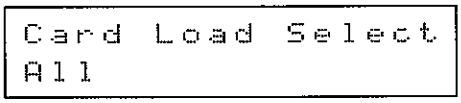
■Loading procedure

1 **Insert a memory card into the card slot.**

2 **Press [DATA TRANSFER].**

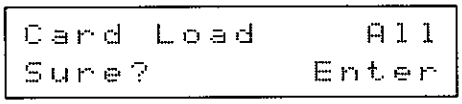


3 **Press [UPPER/►] to select "Load".**

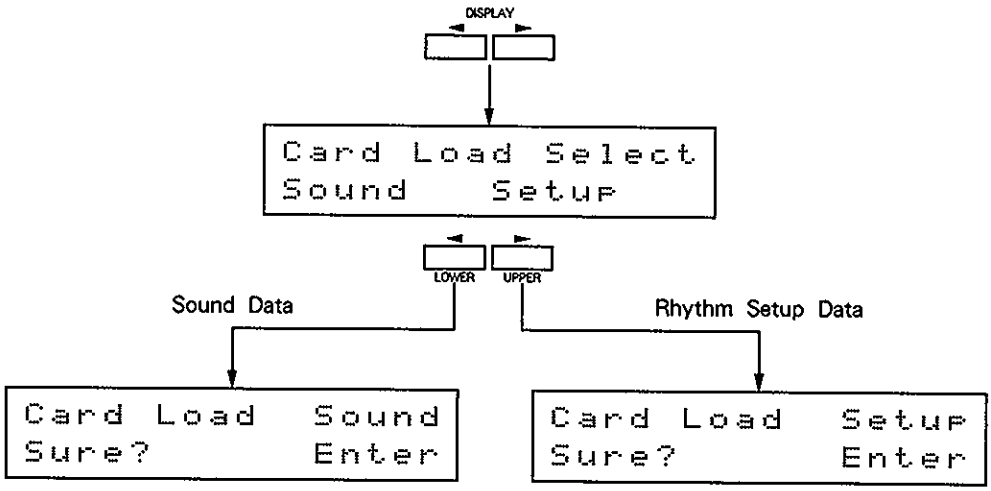


4 **Select the block of data to be loaded.**

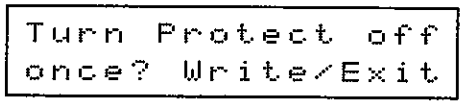
○When loading all data blocks, press either of [◄/LOWER] [UPPER/►].



○When loading individual data blocks, press either of [◄DISPLAY►], and then press [◄/LOWER] [UPPER/►] to select a block.



5 **Press [ENTER].**

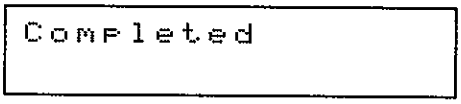


6 **Press [WRITE].**

Memory protect will be temporarily defeated, and you will return to the display of [4].

7 **Press [ENTER] once more.**

When the data has been correctly loaded, the following display will briefly appear, and you will return to the previous play mode display.



*If the data was not correctly loaded, an error message will be displayed. Consult "Error Messages" on page 144, and take appropriate action.

3. Compatibility with the D-10/D-20

The D-5 can use the commercially available sound library memory cards for the D-10/D-20. However, since it is not compatible with some of the D-10/D-20 parameters, there are some limitations. Here we will explain the points to be aware of when using D-10/D-20 memory cards with the D-5.

The D-5 is compatible with the D-10/D-20 except for the following differences.

- The D-5 does not have the reverb and rhythm recording functions of the D-10/D-20.
- The D-10/D-20 do not have the patch effect functions of the the D-5.

Parameters compare as follows.

- Patch parameters : The D-10/D-20 do not have parameters for the four types of patch effect. The D-5 does not have the reverb-related parameters of the D-10/D-20.
- Timbre parameters : Compatible.
- Tone parameters : Compatible.
- Rhythm setup : The D-5 does not have a reverb switch setting for each key number.

■ Playing

When playing the D-5 using D-10/D-20 memory cards, be aware of the following points.

● In Performance mode

When a patch is selected from a D-10/D-20 memory card in Performance play mode, the reverb settings will be ignored, and the patch effect settings will have their initial values.

Effect mode : OFF
Effect rate : 70
Harmony balance : − 02
Chase level : 70
Arpeggio mode : UP

● In Multi Timbral mode

When a memory card timbre is selected from a D-10/D-20 memory card in Multi Timbral mode, operation will be as usual.

■ Data transfer

When transfering data between the D-5 and a D-10/D-20 memory card, be aware of the following points.

● From memory card to D-5

There will be no problem when editing patch/timbre from a D-10/D-20 memory card and writing it into D-5 memory.

In the previously mentioned load operation, when data from a D-10/D-20 memory card is copied to the D-5, patch effect settings will have their initial value, and reverb settings will be ignored. Also, reverb settings for rhythm setup data will be ignored.

● From D-5 to memory card

Due to data compatibility, we do not recommend storing D-5 data into a memory card (RAM) which contains D-10/D-20 data. When using such a memory card with the D-5, see page 120 "When using a new memory card", and convert it into a D-5 memory card.

2 TRANSMITTING DATA VIA MIDI

Using Roland system exclusive messages, data can be transmitted to MIDI sequencers or other D-5's for storage.

■ Data for transmission

Data can be transmitted in the following three ways.

Bulk dump (Bulk load) :
Transmit data by block (All/Sound/Rhythm).
Patch dump/Timbre dump :
Transmit the data of the selected patch/timbre.
Temporary dump :
Transmit the currently edited patch/timbre, tone, rhythm setup.

Transmission procedure for each method is as follows.

Data Transmission by Block

● Bulk Dump (Bulk Load)

All

Master Tuning
Pan (Parts 1—8)
Level (Parts 1—8, Rhythm Part)
MIDI Ch (Parts 1—8, Rhythm Part)
Partial Reserve (Parts 1—8, Rhythm Part)

Sound Block

128 Patches (A11—88, B11—88)
128 Timbres (A11—88, B11—88)
64 Tones (i1—64)

Rhythm Block

Rhythm Setup Data

Individual Data Transmission

● Patch Dump (Data of Selected Patch)

Patch Parameters
Tone Parameters (Upper/Lower)

● Timbre Dump (Data of Selected Timbre)

Timbre Data
Tone Parameters

● Temporary Dump (Data Being Edited)

Patch Parameters
Tone Parameters (Upper/Lower)

Timbre Parameters
Tone Parameters

Rhythm Setup Data

*The data refered to here indicates the settings of the various parameters.

■ The possibilities of exclusive messages

Here are some of the ways in which exclusive messages can be used to transmit D-5 data to other MIDI devices.

By transmitting individual blocks such as Sound and Rhythm into the memory of a MIDI sequencer etc., you will be able to store a much large quantity of data then when using a memory card. Or, by transmitting "All" to another D-5, all of its settings can be precisely matched to the transmitting D-5.

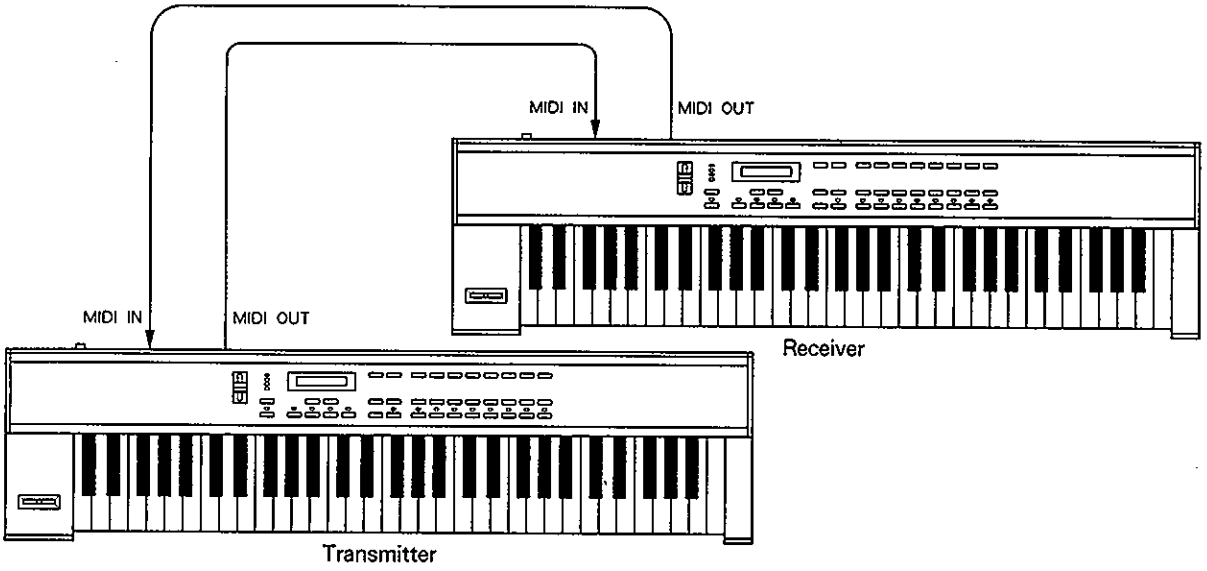
When using a MIDI sequencer to play the D-5, you will normally use program change messages to switch patches and timbres. However, if the same sequencer data is used to play a D-5 that contains different patch/timbre data, the sounds being selected will be different than those you had intended. If you want to sequence another D-5 using the same sounds as when recording, record the desired patch/timbre settings instead of program change data. In other words, record single patch/timbre data into the MIDI sequencer.

■ Transmission methods

There are two methods of data transmission ; handshake and one-way. Each one is explained below. When transmitting data by blocks, either handshake or one-way can be used. Other data is transmitted using only the one way method.

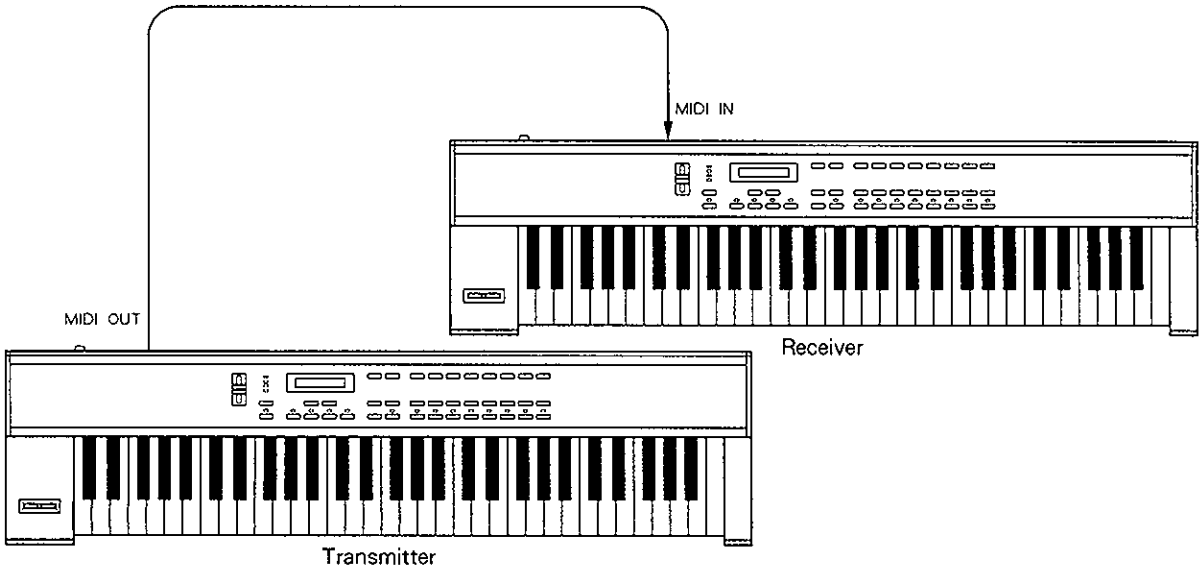
● Handshake

In the handshake method, the two communicating devices (D-5) transmit while exchanging confirmation signals. This allows speedy and secure data transmission. When using the handshake method to transmit, make connections as follows.



● One-way

In the one-way method, data is transmitted regardless of the condition of the receiver. Connections are simple, but the one-way method is a bit slower than handshake. When using the one-way method to transmit, make connections as follows.



1. Transmitting Individual Data

It is possible to individually transmit the data of the selected patch/timbre, or the data (patch/timbre, rhythm setup) currently being edited. When transmitting patch/timbre data, the tone data specified in that patch/timbre will also be transmitted. This is used when you want to record sound data into a MIDI sequencer instead of program change numbers.
Transmission uses the one-way method, so make the appropriate connections.

a. Patch Dump

The data of the selected patch and the upper/lower tone data specified by that patch can be transmitted. This is known as "patch dump".

Before you begin, make sure that you are in Performance mode (the **PERFORMANCE** indicator is lit).

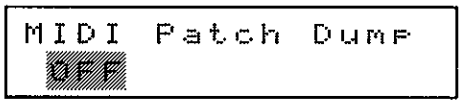
When transmitting data from the D-5 to a MIDI sequencer or to another D-5, use the following procedure.

*Patch dump uses the MIDI unit number to transmit data. When the power is turned on, the MIDI unit number is set to 17.

[1] Turn on the patch dump (MIDI function) of the (transmitting) D-5.

①Press [MIDI].

②Press [◄]DISPLAY[►] several times to get the patch dump display.



③Press VALUE[►] to turn patch dump ON.

*When patch dump is left ON, patch selection will become slower, so for normal playing, you should leave this OFF. When the power is turned on, patch dump will be OFF.
*When using patch dump, you must match the MIDI unit numbers of the transmitter and receiver. To change the MIDI unit number, press [◄]DISPLAY and select the MIDI unit number display, and make the desired setting.

④When you press [EXIT], you will return to Performance play mode.

2 **Select the patch whose data you want to transmit.**

Whenever you select patches, the data of that patch will be transmitted.

When transmitting to a MIDI sequencer, set the MIDI sequencer to receive exclusive messages.
When transmitting to another D-5, data can be received whenever the receiving D-5 is in Performance play mode.

*When using exclusive messages from an external MIDI device (a MIDI sequencer, etc.) to change D-5 patches, make sure that the MIDI unit numbers of both sides match. Patches cannot be changed unless the MIDI unit numbers match.

b. Timbre Dump

The data of the selected timbre and the tone data specified by that timbre can be transmitted. This is known as "timbre dump".

Before you begin, make sure that you are in Multi Timbral mode (the **MULTI TIMBRAL** indicator is lit).

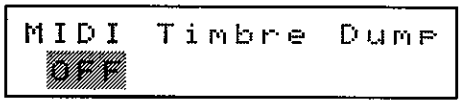
When transmitting data from the D-5 to a MIDI sequencer or to another D-5, use the following procedure.

*Timbre dump uses the MIDI unit number (or the MIDI transmission channel of the keyboard) to transmit data. When the power is turned on, the MIDI unit number is set to 17.

1 Turn on the timbre dump (MIDI function) of the (transmitting) D-5.

①Press [MIDI].

②Press [◄]DISPLAY[►] several times to get the timbre dump display.



③VALUE[►] to turn timbre dump ON.

*When timbre dump is left ON, timbre selection will become slower, so for normal playing, you should leave this OFF. When the power is turned on, timbre dump will be OFF.

*When using timbre dump, you must match the MIDI unit numbers of the transmitter and receiver. To change the MIDI unit number, press [◄]DISPLAY and select the MIDI unit number display, and make the desired setting.

④When you press [EXIT], you will return to Multi Timbral play mode.

2 **After selecting the display of the part whose sound you want to change, select the patch whose data you want to transmit.**
Whenever you select a timbre, the data of that timbre will be transmitted using the MIDI unit number.

When transmitting to a MIDI sequencer, set the MIDI sequencer to receive exclusive messages.
When transmitting to another D-5, data can be received whenever the receiving D-5 is in Multi Timbral play mode.

* If you want to transmit on the keyboard MIDI transmission channel without using the MIDI unit number, select timbres while in the keyboard display.
* When using exclusive messages from an external MIDI device (a MIDI sequencer, etc.) to change D-5 timbres, make sure that the MIDI unit numbers of both sides match. Timbres cannot be changed unless the MIDI unit numbers match. Also, when switching timbres using the MIDI channel, set the MIDI unit number to any setting other than OFF.

c. Temporary Dump

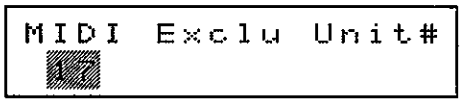
Temporary Dump is to transmit the data of the patch/timbre, tone, and rhythm setup data being edited.
When transmitting the patch/timbre being edited, the tone data specified by that patch/timbre will also be transmited. When transmitting the rhythm setup data that is being edited, setup data for all 85 keys will be transmitted.

*To use temporary dump, there is no need to turn on the MIDI functions patch dump and timbre dump.

Temporary dump uses the MIDI unit number to transmit data. When the power is turned on, the MIDI unit number is set to 17. If you need to change this, use the following procedure.

①Press [MIDI].

②Press [◄]DISPLAY[►] seeral times to get the MIDI unit number display.



③Press [◄]VALUE[►] to change the MIDI unit number.

④Press [EXIT] to return to previous play mode.

● To transmit patch data

While in patch edit, press [ENTER] to transmit the data (patch parameters and the parameters of the two tones assigned to the patch) being edited.

● To transmit timbre data

While in timbre edit, press [ENTER] to transmit the data (timbre parameters and the tone parameter assigned to the timbre) being edited.

● To transmit rhythm setup data

While editing rhythm setup data, press [ENTER] to transmit the data (the entire setup for 85 keys) being edited.

2. Transmitting by Block

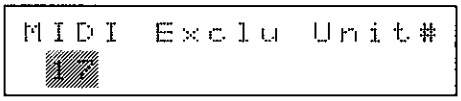
Here we will explain how to transmit blocks of data from one D-5 to another D-5, and how the D-5 receives and transmits data. When using a device such as a MIDI sequencer, you will need to consult the owner's manual for that device.

Data can be transmitted by block using either the handshake method or the one-way method. Before you begin, decide which method you will use, and make the appropriate connections.

1 **Match the MIDI unit numbers of the transmitting and receiving sides.**
When the power is turned on, the MIDI unit number is set to 17. If you need to change this, use the following procedure.

①Press [MIDI].

②Press [◄]DISPLAY[►] several times to get the MIDI unit number display.



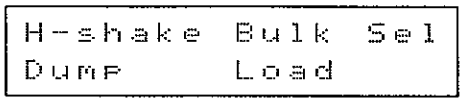
③Press [◄]VALUE[►] to change the MIDI unit number.

④Press [EXIT] to return to the previous play mode.

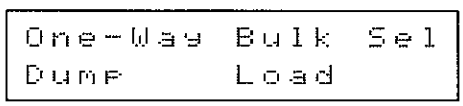
2 **Press [DATA TRANSFER] on both the transmitting and on the receiving device.**

3 **Press [◄]DISPLAY[►] on both the transmitting and on the receiving device to get the following display.**

<When Using Handshake (transmitting side/receiving side)>



<When Using One-way (transmitting side/receiving side)>



(The rest of the procedure is the same for both handshake and one-way.)

4 **On the transmitting device, press [◄/LOWER] to select "Dump" On the receiving device, press [UPPER/►] to select "Load".**

5 **For the transmitting device, select the type of data to be transmitted For the receiving device, select the same type of data.**

○When transmitting all data at ocne, press [◄/LOWER] or [UPPER/►] to select All.

○When transmitting individual blocks, first press either [◄]DISPLAY[►] to switch the display. When transmitting sound data, press [◄/LOWER] (sound), and when transmitting rhythm setups data, press [UPPER/►] (Rhythm).

6 **Press [ENTER] on the receiving device.**

```
Turn Protect off
once? Write/Exit
```

7 **Press [WRITE] on the receiving device.**
Memory protect will be temporarily defeated, and you will return to the display of [5].

8 **Once again, press [ENTER] on the receiving device, and it will be ready to receive data.**

```
H-shake Load
Waiting
```

9 **Press [ENTER] on the transmitting device, and the data will be transmitted.**
When the data has been correctly transmitted, the display will show "Completed" for a short time, and then return to the previous play mode.

*If data was not correctly transmitted, an error message will be displayed. Consult "Error Messages" on page 144, and take appropriate action.

MEMO

SUPPLEMENTARY INFORMATION

1. Error Messages 144
2. Troubleshooting 148
3. Performance Mode List 150
4. Multi Timbral Mode List 151
5. Tone Parameter List 152
6. PCM Sound List 153
7. Rhythm Setup (Factory Settings) 155
8. Preset Tones 156
9. Blank Charts 157
   a. Patch / Timbre 157
   b. Tone 158
   c. Rhythm setup 159

1. Error Messages

When operations are incorrectly executed, or when some unexpected condition arises, an error message will be displayed. Use this section to determine the cause of the error message, and take the actions indicated.

*If the same error message is displayed even though operations are correct, consult a Roland service station.

● Messages which appear when the battery is low

Check
Internal Battery

Problem :
The backup battery of the D-5 is low.
Action :
Consult a Roland service station.

Check
Card's Battery

Problem :
The backup battery of the optional memory card (M-256D, M-256E) is low.
Action :
Read the owner's manual of the card, and replace the battery (CR2016).

● Messages which appear while playing

Card Not Ready

Problrm :
The memory card is not correctly inserted.
Action :
Correctly insert the memory card, and repeat the operation.

Wrong Card

Problem :
A memory card which contains no data or which contains data for devices other than the D-5 (or D-10/D-20) is inserted.
Action :
Insert the correct type of memory card, and repeat the operation.

MIDI Buffer Full

Problem :
This will be displayed when data is received beyond capacity.
Action :
After a short time, you will return to same the condition as when the power has been turned on.

● Messages which appear during writing or data transfer

Turn Protect off
once? Write/Exit

Problem :
The memory protect of the D-5 is turned on.
Action 1 :
If you want to temporarily defeat the memory protect and continue, press [WRITE] and then press [ENTER] again. (See "About memory protect", in the PLAY volume page 99)
Action 2 :
To abort the operation, press [EXIT].

Card Protected

Problem :
The memory protect of the card is turned on.
Action 1 :
Turn the protect switch off, and press [ENTER].
Action 2 :
To abort the operation, press [EXIT].

Wrong Card

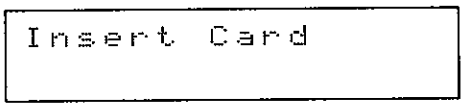
Problem :
A memory card which contains no data or which contains data for devices other than the D-5 (or D-10/D-20) is inserted.
Action 1 :
Insert the correct type of memory card and press [ENTER].
Action 2 :
To abort the operation, press [EXIT].

Wrong Card
Enter

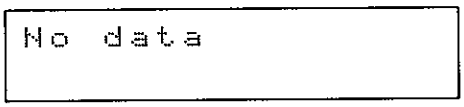
Problem :
When saving data, a memory card which contains no data or which contains data for devices other than the D-5 (or D-10/D-20) is inserted.
Action 1 :
Insert the correct type of memory card and press [ENTER].
Action 2 :
To use a new memory card (or a memory used by other devices) as a D-5 memory card, press [ENTER] and the data will be saved.
Action 3 :
To abort the operation, press [EXIT].

Card Not Ready

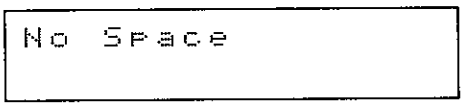
Problem :
The memory card is not correctly inserted.
Action :
Press [EXIT], correctly insert the memory card, and repeat the operation.



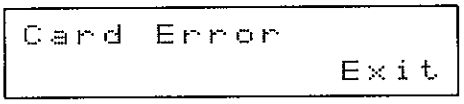
Problem :
The memory card is not correctly inserted.
Action :
Correctly insert the memory card, and repeat the operation.



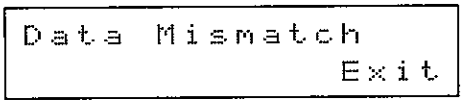
Problem :
The memory card does not contain the specified data (when the inserted memory card is a D-10/D-20 memory card, or a memory card which contains only sound/rhythm data).
Action :
Correctly insert the memory card, and repeat the load operation.



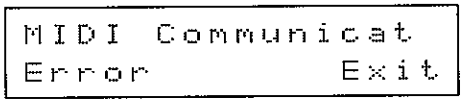
Problem :
The specified data cannot be stored in this memory card (when the inserted memory card is a D-110 memory card, or a memory card which contains only sound/rhythm data).
Action :
Correctly insert the memory card, and repeat the save operation.



Problem :
Data was not correctly saved.
Action :
Press [EXIT], and repeat the save operation.



Problem :
The data settings of the transmitting and receiving devices did not match.
Action :
Press [EXIT], make the correct settings, and repeat the data transfer operation.



Problem :
Data was not correctly received.
Action :
Press [EXIT], and repeat the data transfer operation.

● Other messages

Cancel	EXIT was pressed to cancel the operation.
Completed	Write/data transfer has been completed.

2. Troubleshooting

The D-5 has many functions, and some settings may have unexpected results. In some cases, problems in equipment such as the amp/speaker system may be the cause of failure to produce sound. Here, we will be explaining some common problems and what to do about them.

● No sound/volume is low

○Is the **VOLUME** set low?
Raise the D-5 or amp/speaker system volume to an appropriate level.

○Is there sound in the headphones?
If you hear in a pair of headphones, the problem is in the audio cables or the amp/speaker system. Check the connections.

○Is the MIDI function local control off?
See page 12 "1 Tune/Function".

○(In Multi Timbral mode,) does the keyboard transmit channel match the MIDI channel of the part?
See page 12 "1 Tune/Function".

○(In Multi Timbral mode,) is the volume level of the part too low?
See page 12 "1 Tune/Function".

○Has MIDI volume data been received from an external MIDI device to lower the volume level of the D-5?
Press the [MODE], and select the previous mode once again to return to normal.

● Can't hear the rhythm sounds

○Is the rhythm sound volume level too low?
See page 39 "Section III Rhythm Setup".

○Is the MIDI channel of the rhythm part set correctly?
See page 16 "2 MIDI Functions".

● The pitch is wrong

○Is key transpose being used?
See in the PLAY volume page 40, "Key transpose".

○Is the master tuning incorrect?
See page 12 "1 Tune/Function".

*If the pitch of a specific patch/timbre is incorrect, check the settings of that patch/timbre or tone. (Key shift, fine tune, pitch coarse, pitch fine, etc.)

● Can't change patches/timbres

○Is ROM play or Manual Drums mode selected? (Check the indicators.)
Press [MODE] so that the **PERFORMANCE** or **MULTI TIMBRAL** indicator lights.

○Are you not in play mode? (editing, etc.)
Press [EXIT], retaurn to Play mode.

● Pan settings do not have the expected result

○Does the tone use only one partial?
Tones created using one partial are panned over eight steps.

○Is the tone parameter (common group) structure set to 8 or 9?
When structures 8 or 9 are used, each partial is positioned in a different way. See page 49 "2 Partials and Structures".

● MIDI data is incorrectly transmitted/received

○Are the MIDI functions of the transmitting and receiving sides correctly set?
See page 16 "2 MIDI Functions".

● The programmer cannot be used for editing

○Are the programmer and the D-5 set to matching unit numbers?
See page 16 "2 MIDI Functions".

3. Performance Mode List

Tune/Function	Value
Master Tune (*1)	428 — 453
Memory Protect (*1) (*2)	OFF, ON
Rhythm Level (*1)	0 — 100

MIDI Function	Value
MIDI RxCH	1 — 16
MIDI TxCH	1 — 16
MIDI Rhythm CH (*1)	1 — 16
MIDI Local (*1) (*2)	OFF, ON
MIDI Bender	OFF, ON
MIDI Modulation	OFF, ON
MIDI Rx Volume	OFF, ON
MIDI Hold	OFF, ON
MIDI Program Change	OFF, ON
MIDI Expression (*1)	OFF, ON
MIDI Breath (*1)	OFF, EXP, MOD, E & M
MIDI Unit No. (*1) (*2)	OFF, 17 — 32
MIDI Patch Dump (*1) (*2)	OFF, ON

(* 1) Also effective in Multi Timbral mode.

(* 2) Returns to the initial value when power is turned on.

Memory Protect ..... ON
MIDI Local ..... ON
MIDI Unit No. 17
MIDI Patch Dump ..... OFF

Patch Parameter	Value
Patch Effect Select (*3)	OFF, Chord Play, Harmony, Chase, Arppegio
Key Mode	WHOLE, DUAL, SPLIT
Split Point	C2 — C # 7
Tone Select (LOWER/UPPER)	Tone Group : a, b, i(c), r Tone No. : 1 — 64
Key Shift (LOWER/UPPER)	− 24 — + 24
Fine Tune (LOWER/UPPER)	− 50 — + 50
Bender Range (LOWER/UPPER)	0 — 24
Assign Mode (LOWER/UPPER)	1, 2, 3, 4
Effect Rate	0 — 100
Harmony Balance	− 10 — 0
Chase Shift	− 12 — + 12
Chase Level	0 — 100
Arpeggio Mode	UP, DOWN, U & D, RND
Tone Balance (LOWER/UPPER)	0 — 100
Patch Level	0 — 100
Patch Name	(space) A — Z a — z 0 — 9 & # ! ? . , : ; ' " * + − / < = >

(* 3) Set using the four effect buttons on the panel.

4. Multi Timbral Mode List

Tune/Function	Value
Master Tune (*1)	428—453
Memory Protect (*1)(*2)	OFF, ON
Part R Level (*1)	0—100
Part1—8 Pan & Level	Pan : 7>—><—<7 Leve : 0—100
Part1—8, R Reserve	0—32

Timbre Parameter	Value
Tone Select	Tone Group : a, b, i(c), r Tone No. : 1—64
Key Shift	−24—+24
Fine Tune	−50—+50
Bender Range	0—24
Assign Mode	1, 2, 3, 4

MIDI Function	Value
MIDI Part1—8 RxCH	1—16
MIDI PartR RxCH (*1)	1—16
MIDI Local (*1)	OFF, ON
MIDI Expression (*1)	OFF, ON
MIDI Breath (*1)	Exp, Mod, E & M, OFF
MIDI Unit No. (*1)(*2)	OFF, 17—32
MIDI Timbre Dump (*1)(*2)	OFF, ON
MIDI Keyboard CH	1—16

(*1) Also effective in Performance mode.

(*2) Returns to the initial value when power is turned on.

Memory Protect ..... ON
MIDI Unit No. 17
MIDI Timbre Dump ..... OFF

5. Tone Parameter List

Parameter Group	Parameter	Sound generator (*1) S	Sound generator (*1) P	Value
Common	Tone Name			(space) A — Z a — z 0 — 9 & # ! ? . , : ; ' " * + − / < = >
	Structure 1 & 2			1 — 13
	Structure 3 & 4			1 — 13
	ENV Mode			NORMAL, NO SUSTAIN
	Partial Mute			OFF, ON (*2)
WG Pitch/Mod (Partial 1/2/3/4)	Pitch Coarse	○	○	C1 — C9
	Pitch Fine	○	○	−50 — 0 — +50
	Keyfollow	○	○	−1, −1/2, −1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2 s1, s2
	LFO Rate	○	○	0 — 100
	LFO Depth	○	○	0 — 100
	Modulation Sensitivity	○	○	0 — 100
	Bender Switch	○	○	OFF, ON
WG Form (Partial 1/2/3/4)	Waveform	○	×	SQU, SAW
	PCM Wave Bank	×	○	1, 2
	PCM Wave No.	×	○	1 — 128
	Pulse Width	○	×	0 — 100
	PW Velocity Sensitivity	○	×	−7 — 0 — +7
Pitch ENV (Partial 1/2/3/4)	ENV Depth	○	○	0 — 10
	ENV Velocity Sensitivity	○	○	0 — 3
	ENV Keyfollow (Time)	○	○	0 — 4
Pitch ENV (Partial 1/2/3/4)	Time 1, 2, 3, 4	○	○	0 — 100
	Level 0, 1, 2, End	○	○	−50 — 0 — +50
TVF Frequency (Partial 1/2/3/4)	Cutoff Frequency	○	×	0 — 100
	Resonance	○	×	0 — 30
	Keyfollow (Frequency)	○	×	−1, −1/2, −1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2
	Bias Point	○	×	< A1 — < C7, > A1 — > C7
	Bias Level	○	×	−7 — 0 — +7
TVF ENV (Partial 1/2/3/4)	ENV Depth	○	×	0 — 100
	ENV Depth Velocity Sensitivity	○	×	0 — 100
	ENV Keyfollow (Depth)	○	×	0 — 4
TVF ENV (Partial 1/2/3/4)	ENV Keyfollow (Time)	○	×	0 — 4
	Time 1, 2, 3, 4	○	×	0 — 100
	Level 1, 2, Sustain	○	×	0 — 100
TVA Level (Partial 1/2/3/4)	Level	○	○	0 — 100
	Velocity Sensitivity	○	○	−50 — 0 — +50
	Bias Point 1	○	○	< A1 — < C7, > A1 — > C7
	Bias Level 1	○	○	−12 — 0
	Bias Point 2	○	○	< A1 — < C7, > A1 — > C7
	Bias Level 2	○	○	−12 — 0
	ENV Velocity Follow (T1)	○	○	0 — 4
TVA ENV (Partial 1/2/3/4)	ENV Keyfollow (Time)	○	○	0 — 4
	Time 1, 2, 3, 4	○	○	0 — 100
	Level 1, 2, Sustain	○	○	0 — 100

(*1) S : effective for the synthesizer sound generator
P : effective for the PCM sound generator
(*2) Set using panel number buttons 5 — 8

6. PCM Sound List

Bank 1

No.	PCM Sound Name	Comment
1	Bass Drum – 1	Rhythm Sounds
2	Bass Drum – 2	
3	Bass Drum – 3	
4	Snare Drum – 1	
5	Snare Drum – 2	
6	Snare Drum – 3	
7	Snare Drum – 4	
8	Tom Tom – 1	
9	Tom Tom – 2	
10	High – Hat	
11	High – Hat (Loop)	
12	Crash Cymbal – 1	
13	Crash Cymbal – 2 (Loop)	
14	Ride Cymbal – 1	
15	Ride Cymbal – 2 (Loop)	
16	Cup	
17	China Cymbal – 1	
18	China Cymbal – 2 (Loop)	
19	Rim Shot	
20	Hand Clap	
21	Mute High Conga	
22	Conga	
23	Bongo	
24	Cowbell	
25	Tambourine	
26	Agogo	
27	Claves	
28	Timbale High	
29	Timbale Low	
30	Cabasa	
31	Timpani Attack	Attack Sounds
32	Timpani	
33	Acoustic Piano High	
34	Acoustic Piano Low	
35	Piano Forte Thump	
36	Organ Percussion	
37	Trumpet	
38	Lips	
39	Trombone	
40	Clarinet	
41	Flute High	
42	Flute Low	
43	Steamer	
44	Indian Flute	
45	Breath	
46	Vibraphone High	
47	Vibraphone Low	
48	Marimba	
49	Xylophone High	
50	Xylophone Low	
51	Kalimba	
52	Wind Bell	
53	Chime Bar	
54	Hammer	
55	Guiro	
56	Chink	
57	Nails	
58	Fretless Bass	
59	Pull Bass	
60	Slap Bass	
61	Thump Bass	
62	Acoustic Bass	
63	Electric Bass	
64	Cut Guitar	

No.	PCM Sound Name	Comment
65	Steel Guitar	
66	Dirty Guitar	
67	Pizzicato	
68	Harp	
69	Contrabass	
70	Cello	
71	Violin – 1	
72	Violin – 2	
73	Koto	
74	Draw bars (Loop)	Sustained Sounds
75	High Organ (Loop)	
76	Low Organ (Loop)	
77	Trumpet (Loop)	
78	Troumbone (Loop)	
79	Sax – 1 (Loop)	
80	Sax – 2 (Loop)	
81	Reed (Loop)	
82	Slap Bass (Loop)	
83	Acoustic Bass (Loop)	
84	Electric Bass – 1 (Loop)	
85	Electric Bass – 2 (Loop)	
86	Gut Guital (Loop)	
87	Steel Guitar (Loop)	
88	Electric Guitar (Loop)	
89	Clav (Loop)	
90	Cello (Loop)	
91	Violin (Loop)	
92	Electric Piano – 1 (Loop)	
93	Electric Piano – 2 (Loop)	
94	Harpsichord – 1 (Loop)	
95	Harpsichord – 2 (Loop)	
96	Telephone Bell (Loop)	
97	Female Voice – 1 (Loop)	
98	Female Voice – 1 (Loop)	
99	Male Voice – 1 (Loop)	
100	Male Voice – 2 (Loop)	
101	Spectrum – 1 (Loop)	
102	Spectrum – 2 (Loop)	
103	Spectrum – 3 (Loop)	
104	Spectrum – 4 (Loop)	
105	Spectrum – 5 (Loop)	
106	Spectrum – 6 (Loop)	
107	Spectrum – 7 (Loop)	
108	Spectrum – 8 (Loop)	
109	Spectrum – 9 (Loop)	
110	Spectrum – 10 (Loop)	
111	Noise (Loop)	
112	Shot – 1	Decaying Sounds
113	Shot – 2	
114	Shot – 3	
115	Shot – 4	
116	Shot – 5	
117	Shot – 6	
118	Shot – 7	
119	Shot – 8	
120	Shot – 9	
121	Shot – 10	
122	Shot – 11	
123	Shot – 12	
124	Shot – 13	
125	Shot – 14	
126	Shot – 15	
127	Shot – 16	
128	Shot – 17	

Bank 2

No.	PCM Sound Name	Comment
1	Bass Drum – 1 *	Rhythm Sounds (master tune will not affect the pitch)
2	Bass Drum – 2 *	
3	Bass Drum – 3 *	
4	Snare Drum – 1 *	
5	Snare Drum – 2 *	
6	Snare Drum – 3 *	
7	Snare Drum – 4 *	
8	Tom Tom – 1 *	
9	Tom Tom – 2 *	
10	High – Hat *	
11	High – Hat * (Loop)	
12	Crash Cymbal – 1 *	
13	Crash Cymbal – 2 * (Loop)	
14	Ride Cymbal – 1 *	
15	Ride Cymbal – 2 * (Loop)	
16	Cup *	
17	China Cymbal – 1 *	
18	China Cymbal – 2 * (Loop)	
19	Rim Shot *	
20	Hand Clap *	
21	Mute High Conga *	
22	Conga *	
23	Bongo *	
24	Cowbell *	
25	Tambourine *	
26	Agogo *	
27	Claves *	
28	Timbale High *	
29	Timbale Low *	
30	Cabasa *	
31	Loop – 1	Sound Effects (a loop of the same sound)
32	Loop – 2	
33	Loop – 3	
34	Loop – 4	
35	Loop – 5	
36	Loop – 6	
37	Loop – 7	
38	Loop – 8	
39	Loop – 9	
40	Loop – 10	
41	Loop – 11	
42	Loop – 12	
43	Loop – 13	
44	Loop – 14	
45	Loop – 15	
46	Loop – 16	
47	Loop – 17	
48	Loop – 18	
49	Loop – 19	
50	Loop – 20	
51	Loop – 21	
52	Loop – 22	
53	Loop – 23	
54	Loop – 24	
55	Loop – 25	
56	Loop – 26	
57	Loop – 27	
58	Loop – 28	
59	Loop – 29	
60	Loop – 30	
61	Loop – 31	
62	Loop – 32	
63	Loop – 33	
64	Loop – 34	

No.	PCM Sound Name	Comment
65	Loop – 35	
66	Loop – 36	
67	Loop – 37	
68	Loop – 38	
69	Loop – 39	
70	Loop – 40	
71	Loop – 41	
72	Loop – 42	
73	Loop – 43	
74	Loop – 44	
75	Loop – 45	
76	Loop – 46	
77	Loop – 47	
78	Loop – 48	
79	Loop – 49	
80	Loop – 50	
81	Loop – 51	
82	Loop – 52	
83	Loop – 53	
84	Loop – 54	
85	Loop – 55	
86	Loop – 56	
87	Loop – 57	
88	Loop – 58	
89	Loop – 59	
90	Loop – 60	
91	Loop – 61	
92	Loop – 62	
93	Loop – 63	
94	Loop – 64	
95	Jam – 1 (Loop)	Sound Effects (a loop of several sounds)
96	Jam – 2 (Loop)	
97	Jam – 3 (Loop)	
98	Jam – 4 (Loop)	
99	Jam – 5 (Loop)	
100	Jam – 6 (Loop)	
101	Jam – 7 (Loop)	
102	Jam – 8 (Loop)	
103	Jam – 9 (Loop)	
104	Jam – 10 (Loop)	
105	Jam – 11 (Loop)	
106	Jam – 12 (Loop)	
107	Jam – 13 (Loop)	
108	Jam – 14 (Loop)	
109	Jam – 15 (Loop)	
110	Jam – 16 (Loop)	
111	Jam – 17 (Loop)	
112	Jam – 18 (Loop)	
113	Jam – 19 (Loop)	
114	Jam – 20 (Loop)	
115	Jam – 21 (Loop)	
116	Jam – 22 (Loop)	
117	Jam – 23 (Loop)	
118	Jam – 24 (Loop)	
119	Jam – 25 (Loop)	
120	Jam – 26 (Loop)	
121	Jam – 27 (Loop)	
122	Jam – 28 (Loop)	
123	Jam – 29 (Loop)	
124	Jam – 30 (Loop)	
125	Jam – 31 (Loop)	
126	Jam – 32 (Loop)	
127	Jam – 33 (Loop)	
128	Jam – 34 (Loop)	

7. Rhythm Setup (Factory Settings)

[Preset Rhythm Tones]

No.	Rhythm Tones	Number of Partials
r01	Closed High Hat – 1	1
r02	Closed High Hat – 2	1
r03	Open High Hat – 1	2
r04	Open High Hat – 2	2
r05	Crash Cymbal	2
r06	Crash Cymbal (short)	1
r07	Crash Cymbal (mute)	1
r08	Ride Cymbal	2
r09	Ride Cymbal (short)	1
r10	Ride Cymbal (mute)	1
r11	Cup	2
r12	Cup (mute)	1
r13	China Cymbal	2
r14	Splash Cymbal	1
r15	Bass Drum – 1	2
r16	Bass Drum – 2	1
r17	Bass Drum – 3	2
r18	Bass Drum – 4	1
r19	Snare Drum – 1	1
r20	Snare Drum – 2	1
r21	Snare Drum – 3	1
r22	Snare Drum – 4	2
r23	Snare Drum – 5	1
r24	Snare Drum – 6	1
r25	Rim Shot	1
r26	Brush – 1	2
r27	Brush – 2	2
r28	High Tom Tom – 1	1
r29	Middle Tom Tom – 1	1
r30	Low Tom Tom – 1	1
r31	High Tom Tom – 2	1
r32	Middle Tom Tom – 2	1
r33	Low Tom Tom – 2	1
r34	High Tom Tom – 3	2
r35	Middle Tom Tom – 3	2
r36	Low Tom Tom – 3	2
r37	High Pitch Tom Tom – 1	1
r38	High Pitch Tom Tom – 2	1
r39	Hand Clap	1
r40	Tambourine	1
r41	Cowbell	1
r42	High Bongo	1
r43	Low Bongo	1
r44	High Conga (mute)	1
r45	High Conga	1
r46	Low Conga	1
r47	High Timbale	1
r48	Low Timbale	1
r49	High Agogo	1
r50	Low Agogo	1
r51	Cabasa	1
r52	Maracas	1
r53	Short Whistle	2
r54	Long Whistle	2
r55	Quijada	3
r56	Claves	1
r57	Castanets	2
r58	Triangle	2
r59	Wood Block	1
r60	Bell	2
r61	Native Drum – 1	1
r62	Native Drum – 2	1
r63	Native Drum – 3	1
OFF		0

[Preprogrammed Rhythm Setup]

Rhythm Tones (Tone No.)		Note Number	
Native Drum – 3	(r63)	97	
Native Drum – 2	(r62)	96	C7
Native Drum – 1	(r61)	95	
Ride Cymbaal (short)	(r09)	94	
High Tom Tom – 3	(r34)	93	
Crash Symbal (short)	(r06)	92	
Middle Tom Tom – 3	(r35)	91	
Closed High Hat – 2	(r02)	90	
Low Tom Tom – 3	(r36)	89	
Snare Drum – 6	(r24)	88	
Snare Drum – 5	(r23)	87	
Snare Drum – 4	(r22)	86	
Bass Drum – 4	(r18)	85	
Bass Drum – 3	(r17)	84	C6
Bell	(r60)	83	
Wood Block	(r59)	82	
High Pitch Tom Tom – 1	(r37)	81	
Triangle	(r58)	80	
High Pitch Tom Tom – 2	(r38)	79	
Castanets	(r57)	78	
Brush – 2	(r27)	77	
Brush – 1	(r26)	76	
Claves	(r56)	75	
Cup (mute)	(r12)	74	
Quijada	(r55)	73	
Long Whistle	(r54)	72	C5
Short Whistle	(r53)	71	
Maracas	(r52)	70	
Cabasa	(r51)	69	
Low Agogo	(r50)	68	
High Agogo	(r49)	67	
Low Timbale	(r48)	66	
High Timbale	(r47)	65	
Low Conga	(r46)	64	
High Conga	(r45)	63	
High Conga (mute)	(r44)	62	
Low Bongo	(r43)	61	
High Bongo	(r42)	60	C4
Ride Cymbal (mute)	(r10)	59	
Snare Drum – 3	(r21)	58	
Crash Cymbal (mute)	(r07)	57	
Cowbell	(r41)	56	
Splash Cymbal	(r14)	55	
Tambourine	(r40)	54	
Cup	(r11)	53	
China Cymbal	(r13)	52	
Ride Cymbal	(r08)	51	
High Tom Tom – 2	(r31)	50	
Crash Cymbal	(r05)	49	
High Tom Tom – 1	(r28)	48	C3
Middle Tom Tom – 2	(r32)	47	
Open High Hat – 1	(r03)	46	
Middle Tom Tom – 1	(r29)	45	
Open High Hat – 2	(r04)	44	
Low Tom Tom – 2	(r33)	43	
Closed High Hat – 1	(r01)	42	
Low Tom Tom – 2	(r30)	41	
Snare Drum – 2	(r20)	40	
Hand Clap	(r39)	39	
Snare Drum – 1	(r19)	38	
Rim Shot	(r25)	37	
Bass Drum – 2	(r16)	36	C2
Bass Drum – 1	(r15)	35	

8. Preset Tones

a Group

No.	Tone Name	Number of Partials
01	AcouPiano1	3
02	AcouPiano2	2
03	AcouPiano3	2
04	Honky-Tonk	3
05	ElecPiano1	3
06	ElecPiano2	3
07	ElecPiano3	2
08	ElecPiano4	1
09	ElecOrgan1	4
10	ElecOrgan2	2
11	ElecOrgan3	2
12	ElecOrgan4	1
13	PipeOrgan1	3
14	PipeOrgan2	3
15	PipeOrgan3	2
16	Accordion	2
17	Harpsi 1	3
18	Harpsi 2	2
19	Harpsi 3	1
20	Clav 1	3
21	Clav 2	2
22	Clav 3	2
23	Celesta 1	3
24	Celesta 2	2
25	Violin 1	3
26	Violin 2	2
27	Cello 1	3
28	Cello 2	2
29	Contrabass	2
30	Pizzicato	3
31	Harp 1	3
32	Harp 2	2
33	Strings 1	4
34	Strings 2	3
35	Strings 3	2
36	Strings 4	3
37	Brass 1	4
38	Brass 2	3
39	Brass 3	4
40	Brass 4	4
41	Trumpet 1	3
42	Trumpet 2	2
43	Trombone 1	3
44	Trombone 2	2
45	Horn	3
46	Fr Horn	2
47	Engl Horn	2
48	Tuba	2
49	Flute 1	4
50	Flute 2	2
51	Piccolo	3
52	Recorder	2
53	Pan Pipes	3
54	Bottleblow	3
55	Breathpipe	4
56	Whistle	2
57	Sax 1	2
58	Sax 2	2
59	Sax 3	2
60	Clarinet 1	2
61	Clarinet 2	3
62	Oboe	3
63	Bassoon	2
64	Harmonica	2

b Group

No.	Tone Name	Number of Partials
01	Fantasy	4
02	Harmo Pan	4
03	Chorale	3
04	Glasses	3
05	Soundtrack	4
06	Atmosphere	4
07	Warm Bell	4
08	Space Horn	4
09	Echo Bell	3
10	Ice Rains	4
11	Oboe 2002	2
12	Echo Pan	2
13	Bell Swing	3
14	Reso Synth	2
15	Steam Pad	3
16	VibeString	4
17	Syn Lead 1	4
18	Syn Lead 2	2
19	Syn Lead 3	2
20	Syn Lead 4	2
21	Syn Bass 1	3
22	Syn Bass 2	2
23	Syn Bass 3	2
24	Syn Bass 4	3
25	AcouBass 1	2
26	AcouBass 2	1
27	ElecBass 1	2
28	ElecBass 2	2
29	SlapBass 1	2
30	SlapBass 2	3
31	Fretless 1	4
32	Fretless 2	2
33	Vibe	2
34	Glock	3
35	Marimba	3
36	Xylophone	2
37	Guitar 1	3
38	Guitar 2	3
39	Elec Gtr 1	4
40	Elec Gtr 2	4
41	Koto	2
42	Shamisen	2
43	Jamisen	2
44	Sho	4
45	Shakuhachi	4
46	WadaikoSet	4
47	Sitar	4
48	Steel Drum	4
49	Tech Snare	4
50	Elec Tom	4
51	Revrse Cym	2
52	Ethno Hit	4
53	Timpani	2
54	Triangle	2
55	Wind Bell	3
56	Tube Bell	4
57	Orche Hit	4
58	Bird Tweet	1
59	OneNoteJam	4
60	Telephone	1
61	Typewriter	2
62	Insect	2
63	WaterBells	3
64	JungleTune	4

9. Blank Charts

a. Patch / Timbre

Patch Parameters

No.	Patch Name	
Patch Effect		
Key Mode		
Split Point		
Tone	Upper	
	Lower	
	Lower	Upper
Key Shift		
Fine Tune		
Bender Range		
Assign Mode		
Effect Rate		
Harmony Bal.		
Chase Level		
Chase Shift		
Arp. Mode		
Tone Bal.		
Patch Level		

No.	Patch Name	
Patch Effect		
Key Mode		
Split Point		
Tone	Upper	
	Lower	
	Lower	Upper
Key Shift		
Fine Tune		
Bender Range		
Assign Mode		
Effect Rate		
Harmony Bal.		
Chase Level		
Chase Shift		
Arp. Mode		
Tone Bal.		
Patch Level		

Timbre Parameters

No.	Tone Select	
Key Shift		
Fine Tune		
Bender Range		
Assign Mode		

No.	Tone Select	
Key Shift		
Fine Tune		
Bender Range		
Assign Mode		

No.	Tone Select	
Key Shift		
Fine Tune		
Bender Range		
Assign Mode		

No.	Tone Select	
Key Shift		
Fine Tune		
Bender Range		
Assign Mode		

b. Tone

Tone No.						
OPERATION		PARAMETER	VALUE			
GROUP	BANK					
Common	1	Tone Name				
	2	Structure 1&2			R	
	3	Structure 3&4			R	
	4	ENV Mode				
WG Pitch/Mod	1	WG Pitch Coarse				
	2	WG Pitch Fine				
	3	WG Pitch KF				
	4	LFO Rate				
	5	LFO Depth				
	6	WG Modulation				
	7	WG Bender Switch				
WG Form/ENV	1	WG Waveform				
	2	WG PCM Wave Bank				
	3	WG PCM Wave No.				
	4	WG Pulse Width				
	5	WG PW Velocity				
	6	P-ENV Depth				
	7	P-ENV Velocity				
	8	P-ENV Time KF				
WG P-ENV	1	P-ENV Time 1				
	2	P-ENV Time 2				
	3	P-ENV Time 3				
	4	P-ENV Time 4				
	5	P-ENV Level 0				
	6	P-ENV Level 1				
	7	P-ENV Level 2				
	8	P-ENV End Level				
Partial Mute						
Partial			1	2	3	4

OPERATION		PARAMETER	VALUE			
GROUP	BANK					
TVF Freq/ENV	1	TVF Cutoff Freq				
	2	TVF Resonance				
	3	TVF Freq KF				
	4	TVF Bias Point				
	5	TVF Bias Level				
	6	TVF ENV Depth				
	7	TVF ENV Velocity				
	8	TVF ENV Depth KF				
TVF ENV	1	TVF ENV Time KF				
	2	TVF ENV Time 1				
	3	TVF ENV Time 2				
	4	TVF ENV Time 3				
	5	TVF ENV Time 4				
	6	TVF ENV Level 1				
	7	TVF ENV Level 2				
	8	TVF ENV Sus Levl				
TVA Level	1	TVA Level				
	2	TVA Velocity				
	3	TVA Bias Point 1				
	4	TVA Bias Level 1				
	5	TVA Bias Point 2				
	6	TVA Bias Level 2				
	7	TVA ENV T1 Velo				
TVA ENV	1	TVA ENV Time KF				
	2	TVA ENV Time 1				
	3	TVA ENV Time 2				
	4	TVA ENV Time 3				
	5	TVA ENV Time 4				
	6	TVA ENV Level 1				
	7	TVA ENV Level 2				
	8	TVA ENV Sus Levl				
Partial Mute						
Partial			1	2	3	4

c. Rhythm setup

Note No.	Tone No.	Tone name	Level	Pan
108				
107				
106				
105				
104				
103				
102				
101				
100				
99				
98				
97				
96				
95				
94				
93				
92				
91				
90				
89				
88				
87				
86				
85				
84				
83				
82				
81				
80				
79				
78				
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76				
75				
74				
73				
72				
71				
70				
69				
68				
67				
66				
65				
64				
63				
62				
61				
60				

C8 C7 C6 C5 C4

Note No.	Tone No.	Tone name	Level	Pan
59				
58				
57				
56				
55				
54				
53				
52				
51				
50				
49				
48				
47				
46				
45				
44				
43				
42				
41				
40				
39				
38				
37				
36				
35				
34				
33				
32				
31				
30				
29				
28				
27				
26				
25				
24				

C3 C2 C1

Roland Exclusive Messages

1. Data Format for Exclusive Messages

Roland's MIDI implementation uses the following data format for all exclusive messages (type IV) :

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
CMD	Command ID
[BODY]	Main data
F7H	End of exclusive

MIDI status : F0H, F7H

An exclusive message must be flanked by a pair of status codes, starting with a Manufacturer - ID immediately after F0H (MIDI version1.0).

Manufacturer - ID : 41H

The Manufacturer - ID identifies the manufacturer of a MIDI instrument that triggers an exclusive message. Value 41H represents Roland's Manufacturer - ID.

Device - ID : DEV

The Device - ID contains a unique value that identifies the individual device in the multiple implementation of MIDI instruments. It is usually set to 00H - 0FH, a value smaller by one than that of a basic channel, but value 00H - 1FH may be used for a device with multiple basic channels.

Model - ID : MDL

The Model - ID contains a value that uniquely identifies one model from another. Different models, however, may share an identical Model - ID if they handle similar data.

The Model - ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Model - IDs, each representing a unique model :

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

Command - ID : CMD

The Command - ID indicates the function of an exclusive message. The Command - ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Command - IDs, each representing a unique function :

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

Main data : BODY

This field contains a message to be exchanged across an interface. The exact data size and contents will vary with the Model - ID and Command - ID.

2. Address - mapped Data Transfer

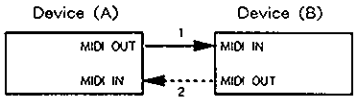
Address mapping is a technique for transferring messages conforming to the data format given in Section 1. It assigns a series of memory - resident records - - waveform and tone data, switch status, and parameters, for example - - to specific locations in a machine - dependent address space, thereby allowing access to data residing at the address a message specifies.

Address - mapped data transfer is therefore independent of models and data categories. This technique allows use of two different transfer procedures : one - way transfer and handshake transfer.

One - way transfer procedure (See Section 3 for details.)

This procedure is suited for the transfer of a small amount of data. It sends out an exclusive message completely independent of a receiving device status.

Connection Diagram

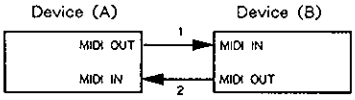


Connection at point 2 is essential for "Request data" procedures. (See Section 3.)

Handshake - transfer procedure (See Section 4 for details.)

This procedure initiates a predetermined transfer sequence (handshaking) across the interface before data transfer takes place. Handshaking ensures that reliability and transfer speed are high enough to handle a large amount of data.

Connection Diagram



Connection at points 1 and 2 is essential.

Notes on the above two procedures

*There are separate Command - IDs for different transfer procedures.
*Devices A and B cannot exchange data unless they use the same transfer procedure, share identical Device - ID and Model ID, and are ready for communication.

3. One - way Transfer Procedure

This procedure sends out data all the way until it stops and is used when the messages are so short that answerbacks need not be checked.
For long messages, however, the receiving device must acquire each message in time with the transfer sequence, which inserts intervals of at least 20 milliseconds in between.

Types of Messages

Message	Command ID
Request data 1	RQ1 (11H)
Data set 1	DT1 (12H)

Request data #1 : RQ1 (11H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.
On receiving an RQ1 message, the remote device checks its memory for the data address and size that satisfy the request.

If it finds them and is ready for communication, the device will transmit a "Data set 1 (DT1)" message, which contains the requested data. Otherwise, the device will send out nothing.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
11H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ssH	Size MSB
⋮	⋮
	LSB
sum	Check sum
F7H	End of exclusive

*The size of the requested data does not indicate the number of bytes that will make up a DT1 message, but represents the address fields where the requested data resides.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The same number of bytes comprises address and size data, which, however, vary with the Model – ID.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

#Data set 1 : DT1 (12H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, a DT1 message can convey the starting address of one or more data as well as a series of data formatted in an address – dependent order.

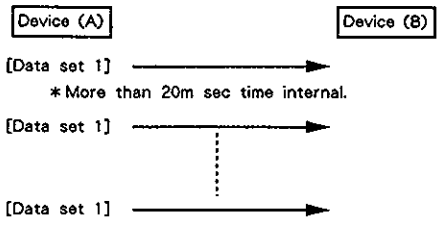
The MIDI standards inhibit non – real time messages from interrupting an exclusive one. This fact is inconvenient for the devices that support a "soft – through" mechanism. To maintain compatibility with such devices, Roland has limited the DT1 to 256 bytes so that an excessively long message is sent out in separate segments.

Byte	Description
F0H	Exclusive
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
12H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ddH	Data
⋮	⋮
sum	Check sum
F7H	End of exclusive

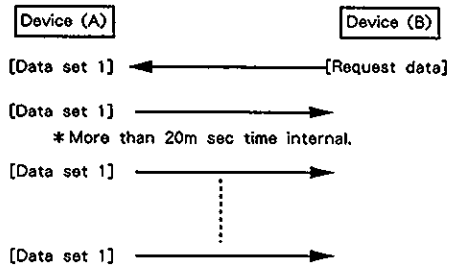
*A DT1 message is capable of providing only the valid data among those specified by an RQ1 message.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The number of bytes comprising address data varies from one Model – ID to another.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

#Example of Message Transactions

●Device A sending data to Device B
Transfer of a DT1 message is all that takes place.



●Device B requesting data from Device A
Device B sends an RQ1 message to Device A. Checking the message, Device A sends a DT1 message back to Device B.



4. Handshake – Transfer Procedure

Handshaking is an interactive process where two devices exchange error checking signals before a message transaction takes place, thereby increasing data reliability. Unlike one – way transfer that inserts a pause between message transactions, handshake transfer allows much speedier transactions because data transfer starts once the receiving device returns a ready signal.

When it comes to handling large amounts of data – – sampler waveforms and synthesizer tones over the entire range, for example – – across a MIDI interface, handshaking transfer is more efficient than one – way transfer.

Types of Messages

Message	Command ID
Want to send data	WSD (40H)
Request data	RQD (41H)
Data set	DAT (42H)
Acknowledge	ACK (43H)
End of data	EOD (45H)
Communication error	ERR (4EH)
Rejection	RJC (4FH)

#Want to send data : WSD (40H)

This message is sent out when data must be sent to a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of the data to be sent.

On receiving a WSD message, the remote device checks its memory for the specified data address and size which will satisfy the request. If it finds them and is ready for communication, the device will return an "Acknowledge (ACK)" message.
Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
40H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ssH	Size MSB
⋮	⋮
	LSB
sum	Check sum
F7H	End of exclusive

*The size of the data to be sent does not indicate the number of bytes that make up a "Data set (DAT)" message, but represents the address fields where the data should reside.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The same number of bytes comprises address and size data, which, however, vary with the Model – ID.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Request data : RQD (41H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.

On receiving an RQD message, the remote device checks its memory for the data address and size which satisfy the request. If it finds them and is ready for communication, the device will transmit a "Data set (DAT)" message, which contains the requested data. Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
41H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ssH	Size MSB
⋮	⋮
	LSB
sum	Check sum
F7H	End of exclusive

*The size of the requested data does not indicate the number of bytes that make up a "Data set (DAT)" message, but represents the address fields where the requested data resides.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The same number of bytes comprises address and size data, which, however, vary with the Model - ID.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Data set : DAT (42H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, the message can convey the starting address of one or more data as well as a series of data formatted in an address - dependent order.

Although the MIDI standards inhibit non - real time messages from interrupting an exclusive one, some devices support a "soft - through" mechanism for such interrupts. To maintain compatibility with such devices, Roland has limited the DAT to 256 bytes so that an excessively long message is sent out in separate segments.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
42H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ddH	Data
⋮	⋮
sum	Check sum
F7H	End of exclusive

*A DAT message is capable of providing only the valid data among those specified by an RQD or WSD message.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The number of bytes comprising address data varies from one model ID to another.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Acknowledge : ACK (43H)

This message is sent out when no error was detected on reception of a WSD, DAT, "End of data (EOD)", or some other message and a requested setup or action is complete. Unless it receives an ACK message, the device at the other end will not proceed to the next operation.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
43H	Command ID
F7H	End of exclusive

End of data : EOD (45H)

This message is sent out to inform a remote device of the end of a message. Communication, however, will not come to an end unless the remote device returns an ACK message even though an EOD message was transmitted.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
45H	Command ID
F7H	End of exclusive

Communications error : ERR (4EH)

This message warns the remote device of a communications fault encountered during message transmission due, for example, to a checksum error. An ERR message may be replaced with a "Rejection (RJC)" one, which terminates the current message transaction in midstream.

When it receives an ERR message, the sending device may either attempt to send out the last message a second time or terminate communication by sending out an RJC message.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
4EH	Command ID
F7H	End of exclusive

Rejection : RJC (4FH)

This message is sent out when there is a need to terminate communication by overriding the current message. An RJC message will be triggered when :

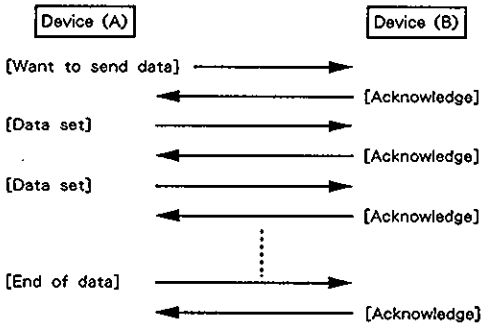
- a WSD or RQD message has specified an illegal data address or size.
- the device is not ready for communication.
- an illegal number of addresses or data has been detected.
- data transfer has been terminated by an operator.
- a communications error has occurred.

An ERR message may be sent out by a device on either side of the interface. Communication must be terminated immediately when either side triggers an ERR message.

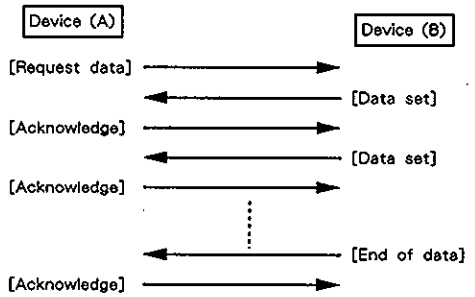
Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
4FH	Command ID
F7H	End of exclusive

Example of Message Transactions

●Data transfer from device (A) to device (B).

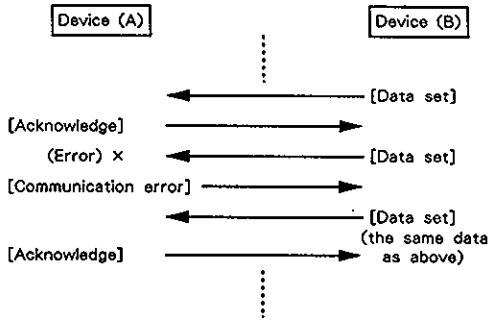


●Device (A) requests and receives data from device (B).

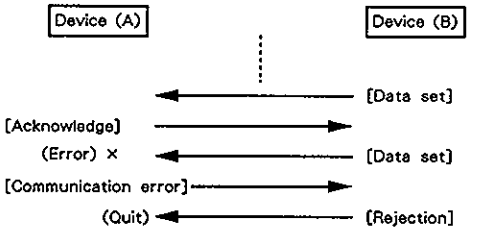


●Error occurs while device (A) is receiving data from device (B).

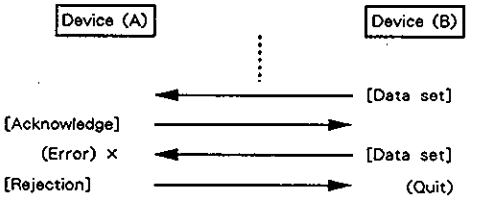
1) Data transfer from device (A) to device (B).



2) Device (B) rejects the data re-transmitted, and quits data transfer.



3) Device (A) immediately quits data transfer.



MIDI Implementation

1. TRANSMITTED DATA (Synthesizer section)

■ Note event

Note off

Status	Second	Third
8nH	kkH	vvH

kk = Note number
*In Performance mode : 0H - 7FH (0 - 127)
*In Multi Timbral mode : 18H - 6CH (24 - 108)
vv = Velocity 0H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

Note on

Status	Second	Third
9nH	kkH	vvH

kk = Note number
*In Performance mode : 0H - 7FH (0 - 127)
*In Multi Timbral mode : 18H - 6CH (24 - 108)
vv = Velocity 01H - 7FH (1 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

■ Control change

Modulation depth

Status	Second	Third
BnH	01H	vvH

vv = Modulation depth 00H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

In Performance mode, transmitted when MIDI Modulation function is on.

Hold 1

Status	Second	Third
BnH	40H	vvH

vv = 00H (0): off
vv = 7FH (127): on
n = MIDI channel No. 0H - FH (1 - 16)

In Performance mode, transmitted when MIDI Hold function is on.

Reset all controllers

Status	Second	Third
BnH	79H	00H

n = MIDI channel No. 0H - FH (1 - 16)

Transmitting upon changing modes (Performance <－> Multi Timbral) or MIDI channels (on the previous channel).

■ Program change

Status	Second
CnH	ppH

pp = Program number 00H - 7FH (1 - 128)
n = MIDI channel No. 0H - FH (1 - 16)

Transmitted when changing Patches/Timbres using A/B, BANK, NUMBER buttons on the D－5, and under following conditions.
In Performance mode, transmitted when MIDI Program change function is on.
In Multi Timbral mode, transmitted only when the LCD is showing the status of keyboard.

pp	A/B	BANK	NUMBER
00H (01)	A	1	1
:	:	:	:
3FH (64)	A	8	8
40H (65)	B	1	1
:	:	:	:
7FH (128)	B	8	8

■ Pitch bender

Status	Second	Third
EnH	llH	mmH

ll = Pitch bend change value (LSB)
mm = Pitch bend change value (MSB)
n = MIDI channel No. 0H - FH (0 - 16)

In Performance mode, transmitted when MIDI Bender function is on.

■ Mode messages

Omni off

Status	Second	Third
BnH	7CH	00H

n = MIDI channel No. 0H - FH (1 - 16)

This message is transmitted on the following conditions and always accompanied by 'Poly'.

1. When D－5 is powerd－up, the message is transmitted through the MIDI transmit channel that has been set by MIDI fuction.
2. When changing MIDI TX channel, the message is transmitted through the new channel.

Poly

Status	Second	Third
BnH	7FH	00H

This message is transmitted on the following conditions and always accompanied by 'Omni off'.

1. When D－5 is powerd－up, the message transmitted on the MIDI transmit channel that has been set by MIDI fuction.
2. When changing MIDI TX channel, the message transmitted on the new channel.

■ Exclusive

Status	
F0H	: System exclusive
F7H	: End of Exclusive

A set of Patch/Timbre parameters is transmitted using MIDI Exclusive messages. Also used for Bulk dump/load oparation.
Refer to section 5 and 'Roland Exclusive Messages' for details.

■ Active sensing

Status
FEH

Transmitted for checking MIDI connection between D－5 and external equipment.

2.TRANSMITTED DATA (Rhythm section)

■ Exclusive

Status	
F0H	: System exclusive
F7H	: End of Exclusive

Bulk dump/load can be operated using the Exclusive messages.
Refer to section 5 and 'Roland Exclusive Messages' for details.

3. RECOGNIZED RECEIVE DATA (Synthesizer section)

■ Note event

Note off

Status	Second	Third
8nH	kkH	vvH
9nH	kkH	00H

kk = Note number 00H - 7FH (0 - 127)
vv = Velocity ignored
n = MIDI channel No. 0H - FH (1 - 16)

Note on

Status	Second	Third
9nH	kkH	vvH

kk = Note number 00H - 7FH (0 - 127)
vv = Velocity 01H - 7FH (1 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

Note numbers outside of the range 12 - 108 are transposed to the nearest octave inside the range.

■ Control change

Modulation depth

Status	Second	Third
BnH	01H	vvH

vv = Modulation depth 00H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

In Performance mode, recognized when MIDI Modulation function is on.
In Multi Timbral mode, always recognized.

Breath

Status	Second	Third
BnH	02H	vvH

vv = Breath 00H - 7FH (0 - 127)

Recognized as expression or modulation according to MIDI Breath function.

Data entry

Status	Second	Third
BnH	06H	vvH

vv = Value of RPN (see RPN MSB section)
n = MIDI channel No.

Main volume

Status	Second	Third
BnH	07H	vvH

Can control the volume of the Part played through the same MIDI channel. The maximum volume is determined also by the Volume knob and Expression message.
In Performance mode, recognized when MIDI Volume function is on.
In Multi Timbral mode, always recognized.

Panpot

Status	Second	Third
BnH	0AH	vvH

vvH = Panpot value 00H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

Expression

Status	Second	Third
BnH	0BH	vvH

vv = Expression value 00H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

Can control the volume of the Parts played through the same MIDI channel. The maximum volume is determined also the Volume knob and Main Volume message.
In Performance mode, recognized when MIDI Expression function is on.
In Multi Timbral mode, always recognized.

Hold 1

Status	Second	Third
BnH	40H	vvH

vv = 00H - 3FH (0 - 63) : off
vv = 40H - 7FH (64 - 127) : on
n = MIDI channel No. 0H - FH (1 - 16)

In Performance mode, recognized when MIDI Hold function is on.
In Multi Timbral mode, always recognized.

RPN LSB

Status	Second	Third
BnH	64H	vvH

vv = LSB of the parameter number controlled by RPN (see RPN MSB section)
n = MIDI channel No. 0H - FH (1 - 16)

RPN MSB

Status	Second	Third
BnH	65H	vvH

vv = MSB of the parameter number controlled by RPN
n = MIDI channel No. 0H - FH (1 - 16)

Using MIDI RPN, parameters can be changed by Control change messages.
RPN MSB and LSB specify the parameter to be controlled, while Data entry shows the parameter value.

Only the Bender range is controllable by RPN on D-5.

RPN MSB	RPN LSB	data entry	comments
00H	00H	vvH	Bender range vv = 0 - 24 can be set within 2 octaves by semitone

Reset all controllers

Status	Second	Third
BnH	79H	00H

n = MIDI channel No. 0H - FH (1 - 16)

When Reset all controllers is recognized, each of the controllers is set as follows.

Controller	Setting
Pitch bender	+/- 0 (center)
Hold1	0 (off)
Modulation	0 (min)

■ Program change

Status	Second
CnH	ppH

pp = Program change number 00H - 7FH (1 - 128)
n = MIDI channel No. 0H - FH (1 - 16)

In Performance mode, recgnized when MIDI Program change function is on and then patch is changed.
In Multi Timbral mode, always recognized and the timbre is changed.

pp	A/B	BANK	NUMBER
00H (01)	A	1	1
:	:	:	:
3FH (64)	A	8	8
40H (65)	B	1	1
:	:	:	:
7FH (128)	B	8	8

■ Pitch bender

Status	Second	Third
EnH	llH	mmH

ll = LSB of Pitch bend change value 00H - 7FH (0 - 127)
mm = MSB of Pitch bend change value 00H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

In Performance mode, recognized when MIDI Bender function is on.
In Multi Timbral mode, always recognized.

■ Mode

Local control

Status	Second	Third
BnH	7AH	vvH

vv = 00H (0) : off
vv = 7FH (127) : on
n = MIDI channel No. 0H - FH (1 - 16)

All notes off

Status	Second	Third
BnH	7BH	00H

n = MIDI channel No. 0H - FH (1 - 16)

When All notes off is recognized, all the notes whitch have been turned on by MIDI Note on message are turned off.

Omni off

Status	Second	Third
BnH	7CH	00H

Recognized as All notes off only.
The D - 5 stays in Mode 3 (Omni off, Poly).

Omni on

Status	Second	Third
BnH	7DH	00H

Recognized as All notes off only.
The D - 5 stays in Mode 3 (Omni off, Poly).

Mono

Status	Second	Third
BnH	7EH	mmH

mm = MONO channel range ignored
n = MIDI channel 0H - FH (1 - 16)

Recognized as All notes off only.
The D - 5 stays in Mode 3 (Omni off, Poly).

Poly

Status	Second	Third
BnH	7FH	00H

n = MIDI channel No. 0H - FH (1 - 16)

Recognized as All notes off only.
The D - 5 stays in Mode 3 (Omni off, Poly).

■ Exclusive

Status	
F0H	: System Exclusive
F7H	: End of Exclusive

A set of Patch/Timbre parameters is transmitted using MIDI Exclusive messages. Also use Bulk dump/load operation.
Refer to section 5 and 'Roland Exclusive Messages' for details.

■ Active sensing

Status
FEH

Once receiving this message, the D - 5 expects to accept status or data in sequence, at last within 300 msec intervals.
If the unit fails to receive a message 300 msec after previous one, it judges there is a problem somewhere in MIDI path, muting the current sound and setting each of controllers as below, then stopping 300 msec - interval monitoring of incoming signal.

Controller	Setting
Pitch bender	+/- 0 (center)
Hold1	0 (off)
Modulation	0 (min)

4. RECOGNIZED RECEIVE DATA (Rhythm section)

MIDI channel is the channel assigned for Rhythm part.

■ Note event

Note off

Status	Second	Third
8nH	kkH	vvH

kk = Note number 18H - 6CH (24 - 108)
vv = Velocity ignored
n = MIDI channel No. 0H - FH (1 - 16)

Note on

Status	Second	Third
9nH	kkH	vvH

kk = Note number 18H - 6CH (24 - 108)
vv = Velocity 01H - 7FH (1 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

Note number outside of 24 - 108 are ignored.

■ Control change

Modulation depth

Status	Second	Third
BnH	01H	vvH

vv = Modulation depth 00H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

In Performance mode, recognized when MIDI Modulation function is on.
In Multi Timbral mode, always recognized.

Breath

Status	Second	Third
BnH	02H	vvH

vv = Breath 0H - 7FH (0 - 127)

Recognized as expression or modulation according to MIDI Breath function.

Data entry

Status	Second	Third
BnH	06H	vvH

vv = Value of RPN (see RPN MSB section)
n = MIDI channel No. 0H - FH (1 - 16)

Main volume

Status	Second	Third
BnH	07H	vvH

vv = Main volume 00H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

Can control volume of the Rhytm section. The maximum volume is determined also by the Volume knob and Expression message.
In Performance mode, recognized when MIDI Volume function is on.
In Multi Timbral mode, always recognized.

Expression

Status	Second	Third
BnH	0BH	vvH

vv = Expression 00H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

Can control volume of the Rhythm section. The maximum volume is determined also by the Volume knob and Main volume message.
Recognized when MIDI Expression function is on.

RPN LSB

Status	Second	Third
BnH	64H	vvH

vv = LSB of parameter number controlled by RPN (see RPN MSB)
n = MIDI channel No. 0H - FH (1 - 16)

RPN MSB

Status	Second	Third
BnH	65H	vvH

vv = MSB of parameter number controlled by RPN
n = MIDI channel No. 0H - FH (1 - 16)

RPN MSB and LSB specify the parameter to be controlled, while Data entry shows the parameter value.
Only the Bender range is controllable by RPN on D-5.

RPN MSB	RPN LSB	data entry	comments
00H	00H	vvH	Bender range vv = 0 - 24 can be set within 2 octaves by semitone

Reset all controllers

Status	Second	Third
BnH	79H	00H

n = MIDI channel No. 0H - FH (1 - 16)

When Reset all controllers is recognized, each of the controllers is set as follows.

Controller	Setting
Pitch bender	+/- 0 (center)
Hold1	0 (off)
Modulation	0 (min)

■ Pitch bender

Status	Second	Third
EnH	llH	mmH

ll = LSB of Pitch bend change value 00H - 7FH (0 - 127)
mm = MSB of Pitch bend change value 00H - 7FH (0 - 127)
n = MIDI channel No. 0H - FH (1 - 16)

■ Exclusive

Status	
F0H	: System Exclusive
F7H	: End of Exclusive

A set of Patch/Timbre parameters is transmitted using MIDI Exclusive messages. Also use Bulk dump/load operation.
Refer to section 5 and 'Roland Exclusive Messages' for details.

■ Active sensing

Status
FEH

Once receiving this message, the D-5 expects to accept status or data in sequence, at last whithin 300 msec intervals.
If the unit fails to receive a message 300 msec after previous one, it judges there is a problem somewhere in MIDI path, muting the current sound and setting each of controllers as below, then stopping 300 msec-interval monitoring of incoming signal.

Controller	Setting
Pitch bender	+/- 0 (center)
Hold1	0 (off)
Modulation	0 (min)

5. EXCLUSIVE COMMUNICATIONS

A set of parameters of a patch or timbre can be transmitted to/from D-5 using one way MIDI exclusive message.
Bulk dumping/loading of internal memory can be performed using either of one way or handshaking communication.

Model-ID# in the exclusive message : 16H
In addition to usual MIDI channel, each D-5 can be provided with a unique ID# called unit # through which any part is made accesible independently of its MIDI channel.

MIDI channel : 1-16 Unit # : 17-32
Whether to use MIDI channel or unit # is dependent on apllication -- refer to description on each message.

NOTE : MIDI standard states that channel starts with "0". So the actual Device # is a number that is "1" substracted from the above-mentioned channel number or unit #.

■ One – way communication

Request data RQ1 11H

When the RQ1 received contains start address listed in the Parameter base address table, and the address size is 1 or more, D – 5 sends the data stored in that address location and the subsequent locations, if any, using DT1 format.
D – 5 never sends this message.
Value of Device ID is always Unit number less 1.

Byte	Comments	
F0H	Exclusive status	
41H	Manufactures ID (Roland)	
DEV	Device ID	
16H	Model ID	
11H	Command ID (RQ1)	
aaH	Address MSB	*7 – 1
aaH	Address	
aaH	Address LSB	
ssH	Size MSB	
ssH	Size	
ssH	Size LSB	
sum	Check sum	
F7H	EOX (End Of eXclusive)	

Data set 1 DT1 12H

When D – 5 is receiver :

a. D – 5 recognizes this message when it has a unit # (17 – 32) which is indecated on MIDI function display. If the address specified in the message corresponds to the current mode (Performance or Multi Timbral) parameter base address, D – 5 stores the data into that and subsequent address locations.
Device – ID # = MIDI channel # less 1 or Unit # less 1

b. When D – 5 receives this message while executing one way bulk loading in data transfer mode with or without having unit # ; And if the address specified in the message corresponds to one of the following parameter base address, D – 5 stores coming data into that and subsequent address locations.
Timbre memory
Patch memory
Tone memory
Rhythm setup
Device – ID number is always Unit # less 1, and when MIDI Unit # is not specified, it is 10H.

When D – 5 is transmitter :

a. With unit # (17 – 32) set
Transmit data directed by RQ1.
Device – ID # = Unit # less 1

b. With unit # (17 – 32) set and Patch/Timbre dump on
Switcing Patch/Timbre from the D – 5 panel causes it to send program change message and parameter data of Patch/Timbre.
Device – ID # :
Peformance mode – – Unit # less 1 (always)
Multi Timbral mode – –
LCD is showing part status : Unit # less 1
LCD is showing keyboard : Transmitting channel number less 1

c. D – 5 sends this message when the Enter button is pressed under editing of Patch, Timbre, Rhythm setup (This is temporary dump).
Transfable addresses :
Timbre temporary
Patch temporary
Patch effect temporary
Tone temporary
Rhythm setup temporary
Device – ID # is Unit # less 1, and when MIDI Unit # is not specified, it is 10H.

d. D – 5 sends this message when one way dump is executed in Data transfer mode.
Transferable addresses :
Timbre memory
Patch memory
Patch effect memory
Tone memory
Rhythm setup memory
System area
Device – ID # is Unit # less 1, and when MIDI Unit # is not specified, it is 10H.

See section 6 (Parameter address map) for details of TX/RX parameters.

Byte	Comments	
F0H	Exclusive status	
41H	Manufactures ID (Roland)	
DEV	Device ID	
16H	Model ID	
12H	Command ID (DT1)	
aaH	Address MSB	*7 – 1
aaH	Address	
aaH	Address LSB	
ddH	Data	*7 – 2
:	:	
sum	Check sum	
F7H	EOX (End Of eXclusive)	

■ Hand shaking communication

Bulk dump/load to and from D – 5 through handshaking communication in Data transfer mode starts with the following message.
Device – ID number is Unit # less 1, and when MIDI Unit # is not specified, it is 10H.

Addresses containable in the bulk dump/load messages :
Timbre memory
Patch memory
Patch effect memory
Tone memory
Rhythm setup memory
System area

Want to send data WSD 40H

Recognizing this message, D – 5 sends ACK (acknowledge) message and waits for coming data.

Byte	Comments	
F0H	Exclusive status	
41H	Manufactures ID (Roland)	
DEV	Device ID	
16H	Model ID	
40H	Command ID (WSD)	
aaH	Address MSB	*7 – 1
aaH	Address	
aaH	Address LSB	
ssH	Size MSB	
ssH	Size	
ssH	Size LSB	
sum	Check sum	
F7H	EOX (End Of eXclusive)	

Request data RQD 41H

When RQD received contains start address listed in the Parameter base address table, and the address size is 1 or more, D – 5 sends the data stored in that address location and the subsequent locations, if any.

Byte	Comments	
F0H	Exclusive status	
41H	Manufactures ID (Roland)	
DEV	Device ID	
16H	Model ID	
41H	Command ID (RQD)	
aaH	Address MSB	*7 – 1
aaH	Address	
aaH	Address LSB	
ssH	Size MSB	
ssH	Size	
ssH	Size LSB	
sum	Check sum	
F7H	EOX (End Of eXclusive)	

Data set DAT 42H

When the DAT received contains address listed in the Parameter base address table, D – 5 stores the data in that address location.

Byte	Comments	
F0H	Exclusive status	
41H	Manufactures ID (Roland)	
DEV	Device ID	
16H	Model ID	
42H	Command ID (DAT)	
aaH	Address MSB	*7 - 1
aaH	Address	
aaH	Address LSB	
ddH	Data	*7 - 2
:		
sum	Check sum	
F7H	EOX (End Of eXclusive)	

Acknowledge ACK 43H

Upon receiving this message in reply to DAT, D - 5 sends the next data; when receives in reply to EOD, ceases current handshaking communication.
D - 5 sends this message upon receipt of WSD or DAT.

Byte	Comments
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
43H	Command ID (ACK)
F7H	EOX (End Of eXclusive)

End of data EOD 45H

Upon recipt of this message, D - 5 sends acknowledge and terminates the current handshaking communication.

Byte	Comments
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
45H	Command ID (EOD)
F7H	EOX (End Of eXclusive)

Communication error ERR 4EH

Should failure in data reception occur (e.g. disagreement of checksum), D - 5 sends this message.
If D - 5 receive this message, it sends the last message again.

Byte	Comments
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
4EH	Command ID (ERR)
F7H	EOX (End Of eXclusive)

Rejection RJC 4FH

D - 5 ends communication upon receipt of this message.

Byte	Comments
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
16H	Model ID
4FH	Command ID (RJC)
F7H	EOX (End Of eXclusive)

*7 - 1	Address and size must specify the address where data exist.
*7 - 2	If the receiving data are system partial parameters, D - 5 recognized these data only after it has received all the partial reserve parameters. (See Table 7 System area)

6. PARAMETER ADDRESS MAP

Addresses are shown in 7 - bit hexadecimal.

Address	MSB		LSB	
Binary	0aaa aaaa	0bbb bbbb	0ccc cccc	
7-bit hex.	AA	BB	CC	

The actual address of a parameter in a block is the sum of the start address of each block and one or more offset address.
Parameters marked by *Table3 have two offset addresses : one in the Table3 and the other one in the Common parameter table (Table3 - 1) or in the Partial parameter table (Table3 - 2).

■ Parameter base address

Temporary area (Accessible on each basic channel)

Start address	Description	
00 00 00	Timbre Temporary Area (synth part)	*Table1
01 00 00	Setup Temporary Area (rhythm part)	*Table2
02 00 00	Tone Temporary Area (synth part)	*Table3

Whole part (Accessible on UNIT#)

Start address	Description	
03 00 00	Timbre Temporary Area (part 1)	*Table1
03 00 10	Timbre Temporary Area (part 2)	
:	:	
03 00 60	Timbre Temporary Area (part 7)	
03 00 70	Timbre Temporary Area (part 8)	
03 01 00	Timbre Temporary Area (rhythm part)	
03 01 10	Rhythm Setup Temporary Area	*Table2
03 04 00	Patch Temporary Area	*Table4
03 04 40	Patch Temporary Area (Patch effect)	*Table5
04 00 00	Tone Temporary Area (part 1/upper)	*Table3
04 01 76	Tone Temporary Area (part 2/lower)	
:	: :	
04 0B 44	Tone Temporary Area (part 7)	
04 0D 3A	Tone Temporary Area (part 8)	
05 00 00	Timbre Memory #1(A-11)	*Table6
05 00 08	Timbre Memory #2(A-12)	
:	:	
05 07 70	Timbre Memory #127(B-87)	
05 07 78	Timbre Memory #128(B-88)	
07 00 00	Patch Memory #1(A-11)	*Table4
07 00 26	Patch Memory #2(A-12)	
:	:	
07 25 34	Patch Memory #127(B-87)	
07 25 5A	Patch Memory #128(B-88)	
08 00 00	Tone Memory #1(101)	*Table3
08 02 00	Tone Memory #2(102)	
:	:	
08 7C 00	Tone Memory #63(163)	
08 7E 00	Tone Memory #64(164)	
09 00 00	Rhythm Setup #1(Note# 24)	*Table2
09 00 04	Rhythm Setup #2(Note# 25)	
:	:	
09 02 4C	Rhythm Setup #84(Note#107)	
09 02 50	Rhythm Setup #85(Note#108)	
0D 00 00	Patch Memory (Patch Effect) #1	*Table5
0D 00 06	Patch Memory (Patch Effect) #2	
:	:	
0D 05 74	Patch Memory (Patch Effect) #127	
0D 05 7A	Patch Memory (Patch Effect) #128	
10 00 00	System Area	*Table7
20 00 00	Display	*Table8
40 00 00	Write Request	*Table9

Notes :

* Table1 Timbre temporary area

D - 5 accepts the data for the area below only in Multi Timbral mode.

Offset address	Description		
00 00H	0000 00aa	TONE GROUP	0 - 3 (a, b, i, r)
00 01H	00aa aaaa	TONE NUMBER	0 - 63 (1 - 64)
00 02H	00aa aaaa	KEY SHIFT	0 - 48 (-24 - +24)
00 03H	0aaa aaaa	FINE TUNE	0 - 100 (-50 - +50)
00 04H	000a aaaa	BENDER RANGE	0 - 24
00 05H	0000 00aa	ASSIGN MODE	0 - 3 (POLY 1, POLY 2, POLY 3, POLY 4)
00 06H	0000 0000	dummy (ignored if received)	
00 07H	0000 0000	dummy (ignored if received)	
00 08H	0aaa aaaa	OUTPUT LEVEL	0 - 100
00 09H	0000 aaaa	PANPOT	0 - 14 (L - R)
00 0AH	0000 0000	dummy (ignored if received)	
:	:	:	
00 0FH	0000 0000	dummy	
Total size		00 00 10H	

* Table2 Rhythm Setup

Offset address	Description		
00 00H	0aaa aaaa	TONE	0 - 127 (101-164, r01-r63, OFF)
00 01H	0aaa aaaa	OUTPUT LEVEL	0 - 100
00 02H	0000 aaaa	PANPOT	0 - 14 (L - R)
00 03H	0000 0000	dummy	
Total size		00 00 04H	

* Table3 Tone Temporary area / Tone Memory

Offset address	Description	
00 00 00	Common parameter	*Table3-1
00 00 0E	Partial parameter (for Partial# 1)	*Table3-2
00 00 48	Partial parameter (for Partial# 2)	
00 01 02	Partial parameter (for Partial# 3)	
00 01 3C	Partial parameter (for Partial# 4)	
Total size		00 01 76H

* Table3 - 1 Common parameters

Offset address	Description		
00H	0aaa aaaa	TONE NAME 1	32 - 127 (ASCII)
:	:		
09H	0aaa aaaa	TONE NAME 10	
0AH	0000 aaaa	Structure of Partial# 1 & 2	0 - 12 (1 - 13)
0BH	0000 aaaa	Structure of Partial# 3 & 4	0 - 12 (1 - 13)
0CH	0000 aaaa	PARTIAL MUTE	0 - 15 (0000 - 1111)
0DH	0000 000a	ENV MODE	0 - 1 (Normal, No sustain)
Total size		00 00 0EH	

* Table3 - 2 Partial parameters

Offset address	Description		
00 00H	0aaa aaaa	WG PITCH COARSE	0 - 96 (C1, C#1, - C9)
00 01H	0aaa aaaa	WG PITCH FINE	0 - 100 (-50 - +50)
00 02H	000a aaaa	WG PITCH KEYFOLLOW	0 - 16 (-1, -1/2, -1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2, s1, s2)
00 03H	0000 000a	WG PITCH BENDER SW	0 - 1 (OFF, ON)
00 04H	0000 00aa	WG WAVEFORM/PCM BANK	0 - 3 (SQU/1, SAW/1, SQU/2, SAW/2)
00 05H	0aaa aaaa	WG PCM WAVE #	0 - 127 (1 - 128)
00 06H	0aaa aaaa	WG PULSE WIDTH	0 - 100
00 07H	0000 aaaa	WG PW VELO SENS	0 - 14 (-7 - +7)
00 08H	0000 aaaa	P-ENV DEPTH	0 - 10
00 09H	0000 00aa	P-ENV VELO SENS	0 - 3
00 0AH	0000 0aaa	P-ENV TIME KEYF	0 - 4
00 0BH	0aaa aaaa	P-ENV TIME 1	0 - 100
00 0CH	0aaa aaaa	P-ENV TIME 2	0 - 100
00 0DH	0aaa aaaa	P-ENV TIME 3	0 - 100
00 0EH	0aaa aaaa	P-ENV TIME 4	0 - 100
00 0FH	0aaa aaaa	P-ENV LEVEL 0	0 - 100 (-50 - +50)
00 10H	0aaa aaaa	P-ENV LEVEL 1	0 - 100 (-50 - +50)
00 11H	0aaa aaaa	P-ENV LEVEL 2	0 - 100 (-50 - +50)
00 12H	0aaa aaaa	dummy (for MT-32)	
00 13H	0aaa aaaa	END LEVEL	0 - 100 (-50 - +50)
00 14H	0aaa aaaa	P-LFO RATE	0 - 100
00 15H	0aaa aaaa	P-LFO DEPTH	0 - 100
00 16H	0aaa aaaa	P-LFO MOD SENS	0 - 100
00 17H	0aaa aaaa	TVF CUTOFF FREQ	0 - 100
00 18H	000a aaaa	TVF RESONANCE	0 - 30
00 19H	0000 aaaa	TVF KEYFOLLOW	0 - 14 (-1, -1/2, -1/4, 0, 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 5/4, 3/2, 2)
00 1AH	0aaa aaaa	TVF BIAS POINT	0 - 127 (<1A - <7C >1A - >7C)
00 1BH	0000 aaaa	TVF BIAS LEVEL	0 - 14 (-7 - +7)
00 1CH	0aaa aaaa	TVF ENV DEPTH	0 - 100
00 1DH	0aaa aaaa	TVF ENV VELO SENS	0 - 100
00 1EH	0000 0aaa	TVF ENV DEPTH KEYF	0 - 4
00 1FH	0000 0aaa	TVF ENV TIME KEYF	0 - 4
00 20H	0aaa aaaa	TVF ENV TIME 1	0 - 100
00 21H	0aaa aaaa	TVF ENV TIME 2	0 - 100
00 22H	0aaa aaaa	TVF ENV TIME 3	0 - 100
00 23H	0aaa aaaa	dummy (for MT-32)	
00 24H	0aaa aaaa	TVF ENV TIME 4	0 - 100
00 25H	0aaa aaaa	TVF ENV LEVEL 1	0 - 100
00 26H	0aaa aaaa	TVF ENV LEVEL 2	0 - 100
00 27H	0aaa aaaa	dummy (for MT-32)	
00 28H	0aaa aaaa	TVF ENV SUSTAIN LEVEL	0 - 100
00 29H	0aaa aaaa	TVA LEVEL	0 - 100
00 2AH	0aaa aaaa	TVA VELO SENS	0 - 100 (-50 - +50)
00 2BH	0aaa aaaa	TVA BIAS POINT 1	0 - 127 (<1A - <7C >1A - >7C)
00 2CH	0000 aaaa	TVA BIAS LEVEL 1	0 - 12 (-12 - 0)
00 2DH	0aaa aaaa	TVA BIAS POINT 2	0 - 127 (<1A - <7C >1A - >7C)
00 2EH	0000 aaaa	TVA BIAS LEVEL 2	0 - 12 (-12 - 0)
00 2FH	0000 0aaa	TVA ENV TIME KEYF	0 - 4
00 30H	0000 0aaa	TVA ENV TIME V_FOLLOW	0 - 4

00 31H	0aaa aaaa	TVA ENV TIME 1	0 - 100
00 32H	0aaa aaaa	TVA ENV TIME 2	0 - 100
00 33H	0aaa aaaa	TVA ENV TIME 3	0 - 100
00 34H	0aaa aaaa	dummy (for MT-32)	
00 35H	0aaa aaaa	TVA ENV TIME 4	0 - 100
00 36H	0aaa aaaa	TVA ENV LEVEL 1	0 - 100
00 37H	0aaa aaaa	TVA ENV LEVEL 2	0 - 100
00 38H	0aaa aaaa	dummy (for MT-32)	
00 39H	0aaa aaaa	TVA ENV SUSTAIN LEVEL	0 - 100
Total size		00 00 3AH	

*Example of RQ1 and DT1 application

Unit number is set at 17 in this example.
Sending the following data string lets D-5 Part 2/Lower tone data from the temporary area.

F0 41 10 16 11 04 01 76 00 01 76 0E F7

*Table4 Patch Temporary area / Patch Memory
D-5 accepts the data for the area below only in Performance mode.

Offset address		Description	
00 00H	0000 00aa	KEY MODE	0 - 2 (whole, dual, split)
00 01H	00aa aaaa	SPLIT POINT	0 - 61 (C2 - C#7)
00 02H	0000 00aa	LOWER TONE GROUP	0 - 3 (a, b, i, r)
00 03H	00aa aaaa	LOWER TONE NUMBER	0 - 63 (1 - 64)
00 04H	0000 00aa	UPPER TONE GROUP	0 - 3 (a, b, i, r)
00 05H	00aa aaaa	UPPER TONE NUMBER	0 - 63 (1 - 64)
00 06H	00aa aaaa	LOWER KEY SHIFT	0 - 48 (-24 - +24)
00 07H	00aa aaaa	UPPER KEY SHIFT	0 - 48 (-24 - +24)
00 08H	0aaa aaaa	LOWER FINE TUNE	0 - 100 (-50 - +50)
00 09H	0aaa aaaa	UPPER FINE TUNE	0 - 100 (-50 - +50)
00 0AH	000a aaaa	LOWER BENDER RANGE	0 - 24
00 0BH	000a aaaa	UPPER BENDER RANGE	0 - 24
00 0CH	0000 00aa	LOWER ASSIGN MODE	0 - 3 (POLY 1, POLY 2, POLY 3, POLY 4)
00 0DH	0000 00aa	UPPER ASSIGN MODE	0 - 3 (POLY 1, POLY 2, POLY 3, POLY 4)
00 0EH	0000 0000	dummy (ignored if received)	
00 0FH	0000 0000	dummy (ignored if received)	
00 10H	0000 0000	dummy (ignored if received)	
00 11H	0000 0000	dummy (ignored if received)	
00 12H	0000 0000	dummy (ignored if received)	
00 13H	0aaa aaaa	U/L BALANCE	0 - 100 (L max<-->U max)
00 14H	0aaa aaaa	PATCH LEVEL	0 - 100
00 15H	0aaa aaaa	PATCH NAME CHAR. 1	32 - 127 (ASCII CODE)
:			
00 24H	0aaa aaaa	PATCH NAME CHAR. 16	
00 25H	0000 0000	dummy (ignored if received)	
Total size		00 00 26H	

*Table5 Patch (Patch Effect) Temporary area / Patch (Patch Effect) Memory
D-5 accepts the data for the area below only in Performance mode.

Offset address		Description	
00 00H	0000 0aaa	EFFECT MODE	0 - 4 (off, chord play, harmony, chase, arpeggio)
00 01H	0aaa aaaa	RATE	0 - 100 (0 - 100)
00 02H	0000 aaaa	HARMONY BALANCE	0 - 12 (-12 - 0)
00 03H	000a aaaa	CHASE SHIFT	0 - 24 (-12 - +12)
00 04H	0aaa aaaa	CHASE LEVEL	0 - 100 (0 - 100)
00 05H	0000 00aa	ARPEGGIO MODE	0 - 3 (UP, DOWN, U&D, RND)
Total size		00 00 08H	

*Example of RQ1 and DT1 application

Unit number is set at 17 in this example.
When D-5 receive following messages in Performance mode, it sends Patch data from the temporary area.

F0 41 10 16 11 03 04 00 00 00 26 53 F7

*Table6 Timbre memory

Offset address		Description	
00 00H	0000 00aa	TONE GROUP	0 - 3 (a, b, i, r)
00 01H	00aa aaaa	TONE NUMBER	0 - 63 (1 - 64)
00 02H	00aa aaaa	KEY SHIFT	0 - 48 (-24 - +24)
00 03H	0aaa aaaa	FINE TUNE	0 - 100 (-50 - +50)
00 04H	000a aaaa	BENDER RANGE	0 - 24
00 05H	0000 00aa	ASSIGN MODE	0 - 3 (POLY 1, POLY 2, POLY 3, POLY 4)
00 06H	0000 0000	dummy (ignored if received)	
00 07H	0000 0000	dummy (ignored if received)	
Total size		00 00 08H	

* Table7 System area

When All is selected for bulk dump/load in data transfer mode, data in this area are transmitted or received together with associated sound data and rhythm data.
Partial reserve must be sent as a package of 9 parts, which in total, should contain no more than 32 partials.

Offset address	Description		
00 00H	0aaa aaaa	MASTER TUNE	0 - 127 (432.1Hz - 457.6Hz)
00 01H	0000 0000	dummy (ignored if received)	
00 02H	0000 0000	dummy (ignored if received)	
00 03H	0000 0000	dummy (ignored if received)	
00 04H	00aa aaaa	PARTIAL RESERVE (Part 1)	0 - 32
00 05H	00aa aaaa	PARTIAL RESERVE (Part 2)	0 - 32
00 06H	00aa aaaa	PARTIAL RESERVE (Part 3)	0 - 32
00 07H	00aa aaaa	PARTIAL RESERVE (Part 4)	0 - 32
00 08H	00aa aaaa	PARTIAL RESERVE (Part 5)	0 - 32
00 09H	00aa aaaa	PARTIAL RESERVE (Part 6)	0 - 32
00 0AH	00aa aaaa	PARTIAL RESERVE (Part 7)	0 - 32
00 0BH	00aa aaaa	PARTIAL RESERVE (Part 8)	0 - 32
00 0CH	00aa aaaa	PARTIAL RESERVE (Part R)	0 - 32
00 0DH	0000 aaaa	MIDI CHANNEL (Part 1)	0 - 15
00 0EH	0000 aaaa	MIDI CHANNEL (Part 2)	0 - 15
00 0FH	0000 aaaa	MIDI CHANNEL (Part 3)	0 - 15
00 10H	0000 aaaa	MIDI CHANNEL (Part 4)	0 - 15
00 11H	0000 aaaa	MIDI CHANNEL (Part 5)	0 - 15
00 12H	0000 aaaa	MIDI CHANNEL (Part 6)	0 - 15
00 13H	0000 aaaa	MIDI CHANNEL (Part 7)	0 - 15
00 14H	0000 aaaa	MIDI CHANNEL (Part 8)	0 - 15
00 15H	0000 aaaa	MIDI CHANNEL (Part R)	0 - 15
00 16H	0000 0000	dummy (for D-110)	
:	:		
00 20H	0000 0000		
00 21H	0aaa aaaa	OUTPUT LEVEL (Part 1)	0 - 100
00 22H	0aaa aaaa	OUTPUT LEVEL (Part 2)	0 - 100
00 23H	0aaa aaaa	OUTPUT LEVEL (Part 3)	0 - 100
00 24H	0aaa aaaa	OUTPUT LEVEL (Part 4)	0 - 100
00 25H	0aaa aaaa	OUTPUT LEVEL (Part 5)	0 - 100
00 26H	0aaa aaaa	OUTPUT LEVEL (Part 6)	0 - 100
00 27H	0aaa aaaa	OUTPUT LEVEL (Part 7)	0 - 100
00 28H	0aaa aaaa	OUTPUT LEVEL (Part 8)	0 - 100
00 29H	0aaa aaaa	OUTPUT LEVEL (Part R)	0 - 100
00 2AH	0000 aaaa	PANPOT (Part 1)	0 - 14
00 2BH	0000 aaaa	PANPOT (Part 2)	0 - 14
00 2CH	0000 aaaa	PANPOT (Part 3)	0 - 14
00 2DH	0000 aaaa	PANPOT (Part 4)	0 - 14
00 2EH	0000 aaaa	PANPOT (Part 5)	0 - 14
00 2FH	0000 aaaa	PANPOT (Part 6)	0 - 14
00 30H	0000 aaaa	PANPOT (Part 7)	0 - 14
00 31H	0000 aaaa	PANPOT (Part 8)	0 - 14
Total size	00 00 32H		

* Exanple of RQ1 and DT1 application

Unit number is set at 17 in this example.
The byte string shown below will set Partial reserve of each part as follows:
Part 1 : 8 Part 3 thru 8 : 0
Part 2 : 10 Rhythm part : 8

F0 41 10 16 12 10 00 04 08 0A 00 00 00 00 00 00 08 52 F7

* Table8 DISPLAY

D-5 deciphers incoming data and sends then to the LCD as a string of ASCII code characters.
The display data in this area cannot brought outside D-5 trough MIDI message, such as RQ1 and DT1.

Offset address	Description		
00H	0aaa aaaa	DISPLAYED LETTER	32 - 127 (ASCII)
:			
1FH	0aaa aaaa	DISPLAYED LETTER	
Total size	00 00 20H		

* Table9 Write Request

This message simulates write switch : D-5 stores the data of each part in the temporary area into individual memory locations specified by two byte data.
Timbre write is effective only in Multi Timbral mode; Patch write only in Performance mode.
The data in this area cannot be brought outside D-5 through MIDI message, such as RQ1 and DT1.
D-5 returs the result to the transmitter.

Offset address	Description		
00 00H	00aa aaaa	Tone Write (part 1/upper)	0 - 63 (01 - 64)
00 01H	0000 000a		0, 1 (Internal, Card)
00 02H	00aa aaaa	Tone Write (part 2/lower)	
00 03H	0000 000a		
:	:		
00 0EH	00aa aaaa	Tone Write (part 8)	
00 0FH	0000 000a		
01 00H	0aaa aaaa	Timbre Write	0 - 127 (All - B88)
01 01H	0000 000a		0, 1 (Internal, Card)
01 02H	0aaa aaaa	Timbre Write (part 2)	
01 03H	0000 000a		
:	:		
01 0EH	0aaa aaaa	Timbre Write (part 8)	
01 0FH	0000 000a		
03 00H	0aaa aaaa	Patch Write	0 - 127 (All - B88)
03 01H	0000 000a		0, 1 (Internal, Card)
10 00H	0000 00aa	Result	0 - 3
			0 = Function Completed
			1 = Card Not Ready
			2 = Write Protected
			3 = Incorrect Mode

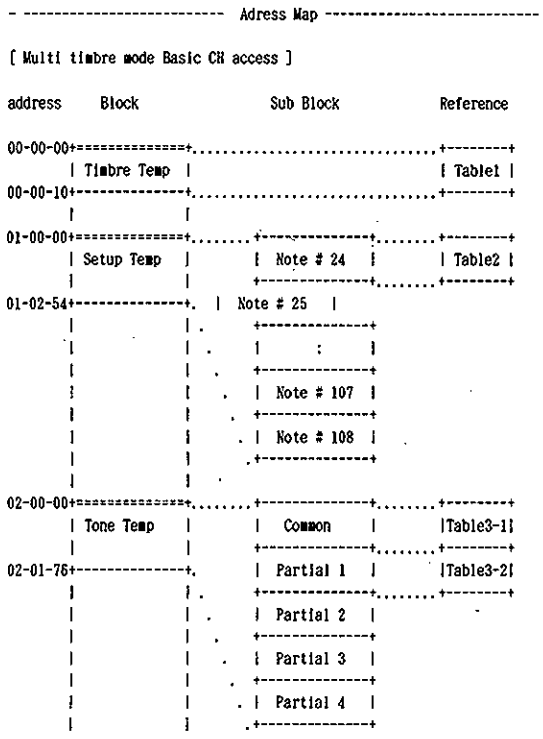
* Example of RQ1 and DT1 application

Unit number is set at 17 in this example.
Sending the following byte string will enable D-5 to write data in Part3 in temporary data into I-B24.

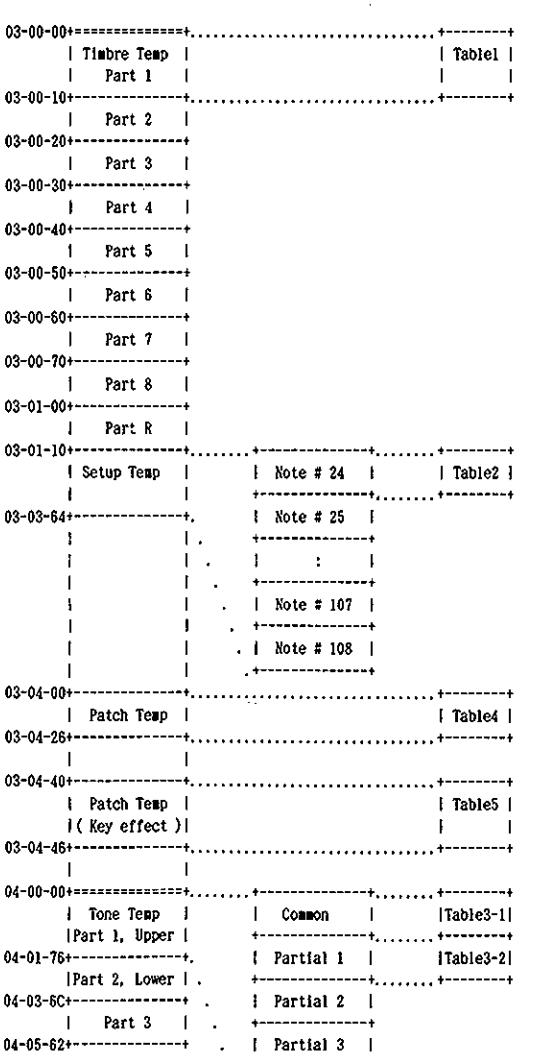
F0 41 10 16 12 40 01 04 4B 00 70 F7

- ------------------------ Adress Map ----------------------------

[Multi timbre mode Basic CH access]



[Unit # access]



LINEAR SYNTHESIZER (Multi Timbral mode synth part 1 – 8) Date : Jan. 30. 1989

Model D – 5

MIDI Implementation Chart

Version : 1.00

Function •••		Transmitted	Recognized	Remarks
Basic	Default	×	1 – 16	Memorized
Channel	Changed	×	1 – 16	
Mode	Default	×	Mode 3	
	Messages	×	×	
	Alterd	*********		
Note		×	0 – 127	
Number	True Voice	*********	12 – 108	
Velocity	Note ON	×	○ v = 1 – 127	
	Note OFF	×	×	
After	Key's	×	×	
Touch	Ch's	×	×	
Pitch Bender		×	○ 0 – 24 semi	9 bit resolution
Control Change	1	×	○	Modulation
	2	×	* (Memorized)	Breath
	6	×	**	Data Entry
	7	×	○	Volume
	10	×	○	Panpot
	11	×	* (Memorized)	Expression
	64	×	○	Hold 1
	100, 101	×	** (0)	RPN LSB, MSB
	121	×	○	Reset All Controllers
Prog		×	○ 0 – 127	
Change	True #	*********	0 – 127	
System Exclusive		○	*	Tone Parameters
System	Song Pos	×	×	
Common	Song Sel	×	×	
	Tune	×	×	
System	Clock	×	×	
Real Time	Commands	×	×	
	Local ON/OFF	×	×	
Aux	All Notes OFF	×	○ (123 – 127)	
Message	Active Sense	×	○	
	Reset	×	×	

Notes

* Can be set to ○ or × manually.

** RPN = Registered Parameter Number
RPN # 0 : Pitch Bend Sensitivity
The value of parameter is to be determined by entering data.

Mode 1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO

○ : Yes
× : No

LINEAR SYNTHESIZER (Multi Timbral mode Keyboard) Date : Jan. 30. 1989

Model D－5

MIDI Implementation Chart

Version : 1.00

Function •••		Transmitted	Recognized	Remarks
Basic Channel	Default	1－16	×	Memorized
	Changed	1－16	×	
Mode	Default	Mode 3	×	
	Messages	POLY OMNI OFF	×	
	Alterd	*********		
Note Number	True Voice	24－108	×	
		*********	×	
Velocity	Note ON	○ v＝1－127	×	
	Note OFF	○ v＝0－127	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		○	×	9 bit resolution
Control Change	1	○	×	Modulation
	64	○	×	Hold 1
	121	○	×	Reset All Controllers
Prog Change	True #	* 0－127	×	
		*********		
System Exclusive		×	×	
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Message	Local ON/OFF	×	○	
	All Notes OFF	×	×	
	Active Sense	○	×	
	Reset	×	×	
Notes		* Can be transmitted when the LCD displays the status of keyboard.		

Mode 1 : OMNI ON, POLY　　Mode 2 : OMNI ON, MONO　　○ : Yes

Mode 3 : OMNI OFF, POLY　　Mode 4 : OMNI OFF, MONO　　× : No

LINEAR SYNTHESIZER (Performance mode) Date : Jan. 30. 1989

Model D－5

MIDI Implementation Chart

Version : 1.00

Function ...		Transmitted	Recognized	Remarks
Basic Channel	Default	1 - 16	1 - 16	Memorized
	Changed	1 - 16	1 - 16	
Mode	Default	Mode 3	Mode 3	
	Messages	POLY OMNI OFF	×	
	Alterd	*********		
Note Number	True Voice	0 - 127	0 - 127	
		*********	12 - 108	
Velocity	Note ON	○ v = 1 - 127	○ v = 1 - 127	
	Note OFF	○ v = 0 - 127	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		* (Memorized)	* (Memorized) 0-24 semi	9 bit resolution
Control Change	1	*	* (Memorized)	Modulation
	2	×	* (Memorized)	Breath
	6	×	**	Data Entry
	7	×	* (Memorized)	Volume
	11	×	* (Memorized)	Expression
	64	* (Memorized)	* (Memorized)	Hold 1
	100, 101	×	** (0)	RPN LSB, MSB
	121	○	○	Reset All Controllers
Prog Change	True #	* (Memorized) 0 - 127	* (Memorized) 0 - 127	
		*********	0 - 127	
System Exclusive		○	*	Tone Parameters
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Message	Local ON/OFF	×	○	
	All Notes OFF	×	○ (123 - 127)	
	Active Sense	○	○	
	Reset	×	×	

Notes

* Can be set to ○ or × manually.

**RPN = Registered Parameter Number
RPN # 0 : Pitch Bend Sensitivity
The value of parameter is to be determined by entering data.

Mode 1 : OMNI ON, POLY　　Mode 2 : OMNI ON, MONO　　○ : Yes

Mode 3 : OMNI OFF, POLY　　Mode 4 : OMNI OFF, MONO　　× : No

LINEAR SYNTHESIZER (Rhythm section)
Model D－5

MIDI Implementation Chart

Date : Jan. 30. 1989
Version : 1.00

Function ...		Transmitted	Recognized	Remarks
Basic Channel	Default	×	1－16	Memorized
	Changed	×	1－16	
Mode	Default	×	Mode 3	
	Messages	×	×	
	Alterd	*********		
Note Number		×	24－108	
	True Voice	*********	24－108	
Velocity	Note ON	×	○ v＝1－127	
	Note OFF	×	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		×	* (Memorized) 0-24 semi	9 bit resolution
Control Change	1	×	* (Memorized)	Modulation
	2	×	* (Memorized)	Breath
	6	×	**	Data Entry
	7	×	* (Memorized)	Volume
	11	×	* (Memorized)	Expression
	100, 101	×	** (0)	RPN LSB, MSB
	121	×	○	Reset All Controllers
Prog Change		×	×	
	True #	*********		
System Exclusive		○	*	Setup Data
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Message	Local ON/OFF	×	×	
	All Notes OFF	×	○	
	Active Sense	×	○	
	Reset	×	×	

Notes

* Can be set to ○ or × manually.
** RPN = Registered Parameter Number
RPN # 0 : Pitch Bend Sensitivity

Mode 1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO

○ : Yes
× : No

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Roland

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